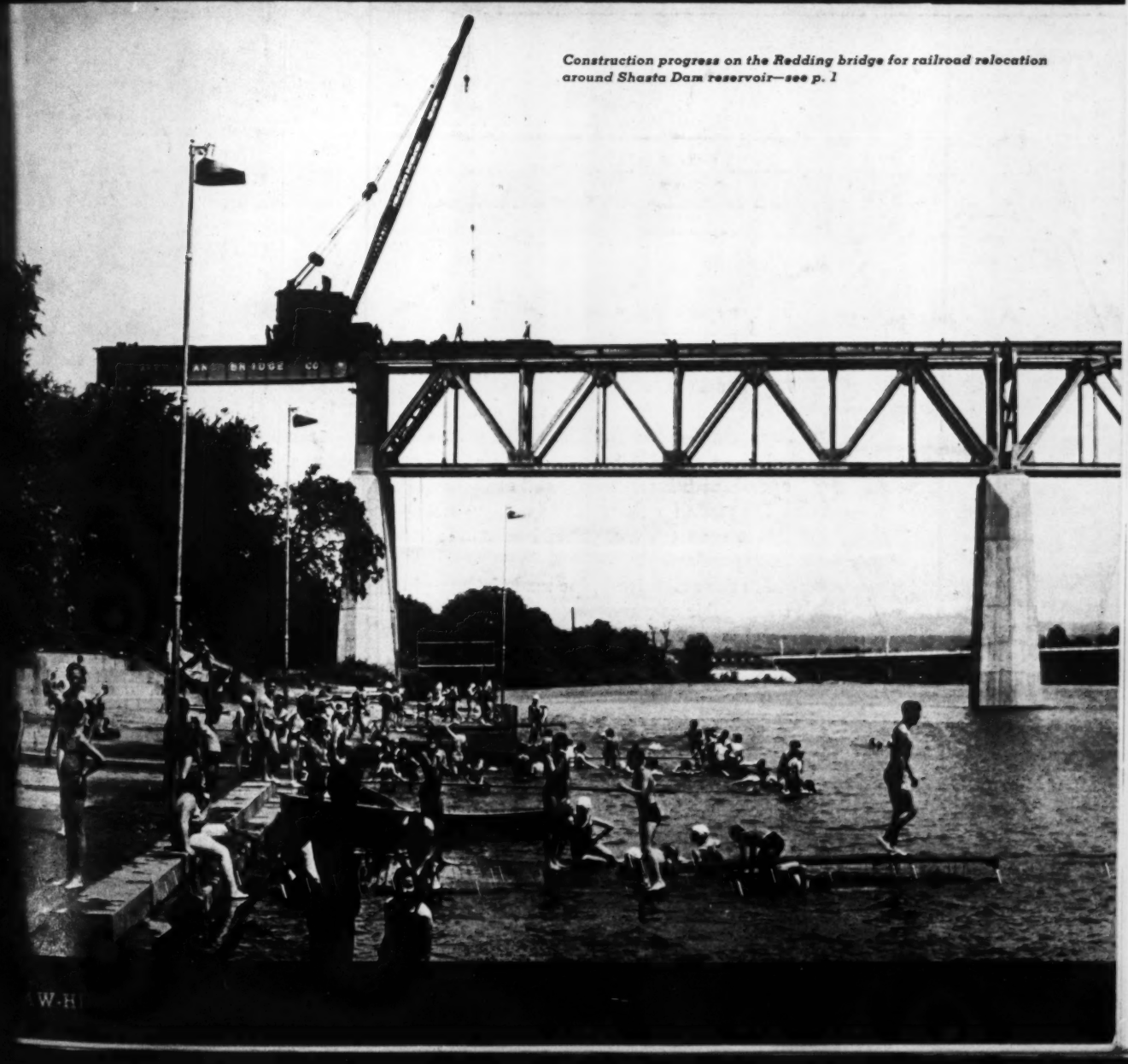
NEWS



Construction progress on the Redding bridge for railroad relocation around Shasta Dam reservoir—see p. 1

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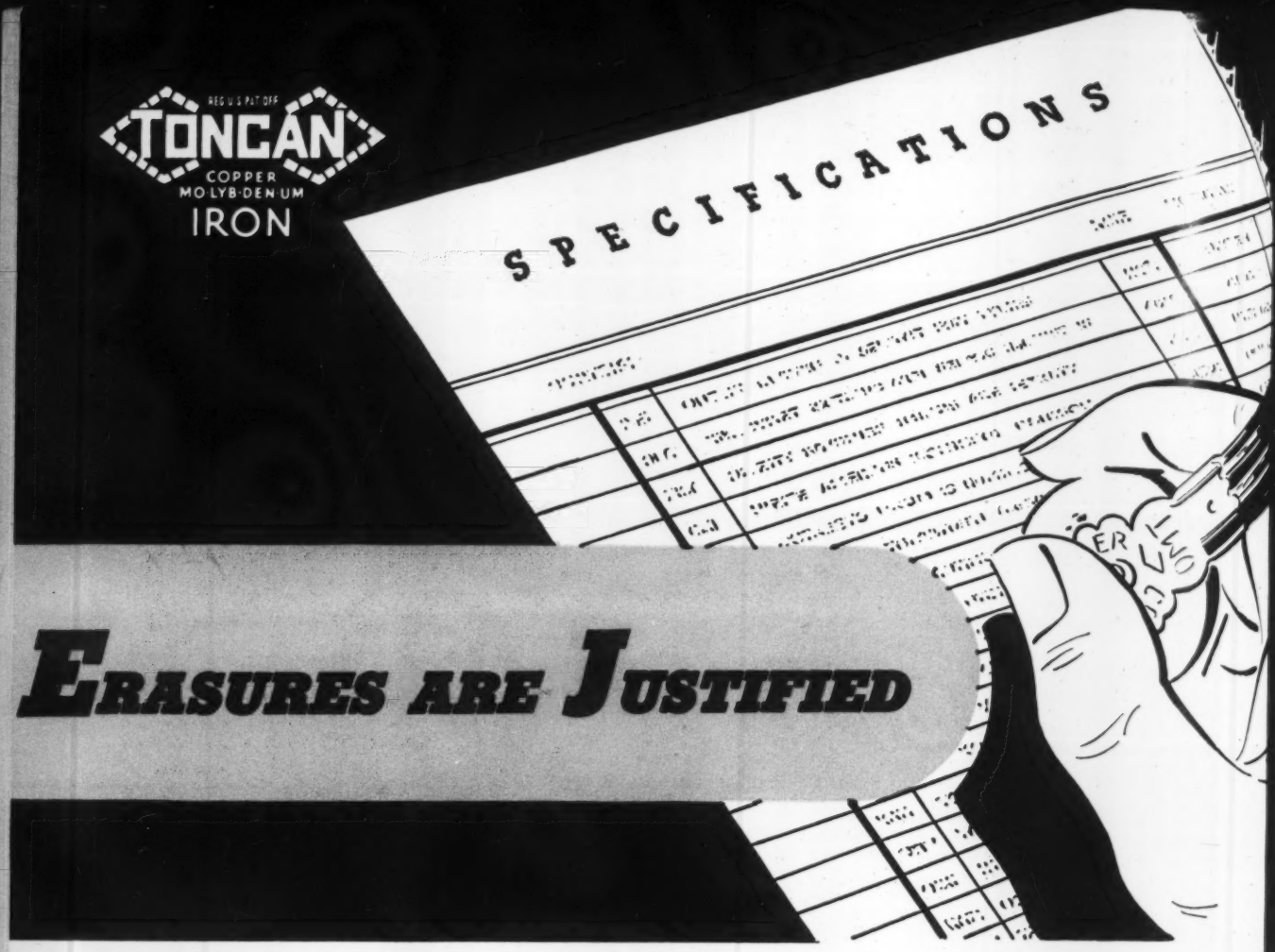

ERASURES ARE JUSTIFIED

When You Find a Better Material to Write into Your Specifications

Many a specification covering the piping for a water supply system, a sewage disposal plant, a swimming pool, a municipal building, has been changed when all the facts about Toncan Iron Pipe are understood. Read them — and you'll see why.

It's an IRON PIPE — an alloy of refined open-hearth iron, copper and molybdenum.

It's made by the electric weld process — by the country's recognized leader in ferrous alloy production.

It's the oldest iron pipe made in iron pipe sizes in this country.

It has proved to engineers everywhere that it pays dividends where service is severe — because it possesses the highest resistance to corrosion of any ferrous material in its price class.

It is made in sizes up to 16-inch O.D. The same material is available in plates and sheets and many fabricated forms — to make any installation equally corrosion resistant throughout.

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An alloy of refined open-hearth iron, copper and molybdenum — *that grows old slowly*

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ENGINEERING NEWS-RECORD

NEWS

Volume 123 AUGUST 24, 1939 Number 8

NOTEBOOK NEWS

Quick Surveys of Construction Events

▶ Making good on his frequent assertion that if the government would limit the scope of its power activities the power companies would begin to build new facilities, Wendell Willkie, head of the Commonwealth & Southern Power Corp., on the day following the conclusion of negotiations for the sale of the company's power properties in Tennessee to the TVA, announced that the company would immediately undertake a $16,000,000 construction program in Alabama.

▶ Another agreement that released a lot of construction was that between the AFL building trades unions and the Associated General Contractors for the settlement of jurisdictional disputes without stopping work, noted in these pages last week. As a result of that agreement, Mayor LaGuardia of New York has announced that $20,000,000 of housing will be begun in that city.

▶ Hope for new Manhattan-Brooklyn traffic facilities in New York City has shifted from a bridge or tunnel at the Battery to a proposal to reconstruct Brooklyn Bridge and its approaches. A Battery tunnel is out because of high cost, a Battery Bridge because of the War Department's "No," so the city department of public works has asked to be permitted to put a new modern deck on the famous Brooklyn Bridge.

▶ The cover picture shows one of eight new bridges that the Southern Pacific is building on the 30 mi. of new railway that it must construct to get its tracks out of the valley to be occupied by Shasta Dam and its reservoir. Bathers at the Municipal Beach at Redding, Calif., have one of the best sites yet found for a "Sidewalk Superintendent's Club."

No Negligence Found In Tunnel Accident

"Shock and injuries received from falling rock as a result of unavoidable and unforeseen accident" was the ruling of a coroner's jury probing the Pennsylvania turnpike accident Aug. 16, in which four tunnel workers were killed on the Laurel Hill project. (*ENR*, Aug. 10, 1939, p. 179).

During the investigation it was revealed that no shoring was used because the engineers did not know of the existence of the shale at the point in the tunnel where the accident occurred.

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Taxable Bonds to Be Issued For Niagara Bridge

The Niagara Falls Bridge Commission has adopted a resolution authorizing an issue of $3,850,000 in bonds to finance construction of a new international bridge at Niagara Falls on the site of the "Honeymoon" span destroyed by ice in January, 1938. The bonds will not be tax exempt. Recently President Roosevelt voiced objection to financing this work with tax-exempt bonds, a type called for in earlier action by the commission. Start of work on the bridge has been held up by this and numerous other difficulties.

• • •

Atkinson Low Bidder On Stevens Dam

The G. F. Atkinson Co., San Francisco, was low bidder when bids were opened Aug. 21 at Seattle for construction of Stevens Dam (formerly Mud Mountain Dam). The Atkinson Co.'s bid was $5,344,000, the engineer's estimate being $5,713,000.

The dam, a rolled earth fill 400 ft. high in a narrow canyon 37 miles from Seattle on the White River near Enumclaw, Wash., is for flood control. (*ENR*, May 18, 1939, p. 684).

Brooklyn Bridge Rebuilding Proposed

Four-year plan includes new ramps and increase of traffic lanes from four to six

Rebuilding of Brooklyn Bridge to provide new ramps and increase the present four traffic lanes to six has been recommended by the Department of Public Works to the City Planning Commission of New York City.

The improvement, to be conducted over a 4-year period, is estimated to cost $15,500,000, and is viewed as a substitute for any plan to build a Battery bridge or tunnel across the East River.

Under the tentative plan now proposed the anchorages, towers and cables of the present bridge would be retained, but a new deck, new suspender ropes, and new stiffening girders would be installed. The deck would provide for three lanes of traffic each way between curbs 31.5 ft. apart. The sidewalk would be elevated over the dividing strip in the center of the deck, as it is at present.

Suggested improvement of the bridge was submitted as part of a public works program to run from 1940 through 1945. The plan calls for a $300,000 appropriation for 1941 to be used for careful inspection of present bridge and for design study; $7,000,000 for 1942; $5,000,000 for 1943; and $3,200,000 for 1944. Only $6,000,000 to $7,000,000 would be used for the bridge and the remainder for approaches.

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Soils Testing Laboratory Established at Vanderbilt

A soils mechanics laboratory for the civil engineering department has been established at Vanderbilt University at Nashville. W. A. Coolidge, professor in the department, will be in charge.

ENGINEERING NEWS-RECORD—Published every Thursday by McGraw-Hill Publishing Company, Inc. Publication Office, 99-129 North Broadway, Albany, N. Y. Editorial and Executive Offices, 330 W. 42nd Street, New York, N. Y. James H. McGraw, Jr., President; Howard Ehrlich, Executive Vice-President; James H. McGraw, Honorary Chairman; Mason Britton, Vice-Chairman; B. R. Putnam, Treasurer; D. C. McGraw, Secretary; J. E. Blackburn, Jr., Circulation Manager. Subscription rates in the United States, Canada, Mexico, Central and South American countries, $5 a year; all other countries, $9, or 36 shillings a year. Entered as second-class matter October 29, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in U. S. A. Copyright 1939, by McGraw-Hill Publishing Company, Inc. Cable address: McGRAWHILL, New York. Member A.B.P. Member A.B.C.

(Vol. p. 243)

Charges Brought Against Brooklyn Housing Head

Based upon alleged incompetency, untruthfulness and failure to account for bank deposits, removal charges have been filed against John J. Moran, Acting Superintendent of the Department of Housing and Buildings for Brooklyn, N. Y. William P. Herlands, Brooklyn commissioner of investigation, in an official report charges that Moran was unable to explain a total of $78,000 in bank deposits and that he delayed and hampered an investigation of his financial affairs since he entered the city service in 1921.

He is also charged with dishonesty, neglect and incompetent supervision by granting building permits for garages and gasoline service stations of poor construction too close to schools and hospitals. False statements when applying for renewal of his professional engineer's license in 1932, 1933 and 1936 is also charged.

• • •

Highway Official Acquitted In Pennsylvania

H. H. Temple, former chief engineer of the Pennsylvania State Highway Department, was acquitted August 19 of the charge to extort and levy blackmail against insurance agents and road contractors.

James E. Kirk, Pittsburgh insurance man, and Victor S. Skok, an associate in the bonding business, at the same time, were convicted of conspiring to extort and misuse the office of the secretary of highways during the administration of Governor Earle. The decision was handed down in the Dauphin County court, the judge explaining that the maximum penalty could not exceed two years imprisonment or a fine of $500 for each of the offenders.

• • •

Narrows Bridge Contractors Get Extra Compensation

The Pacific Bridge Co., San Francisco, the General Construction Co. of Seattle and the Columbia Construction Co. of Portland, contractors for the $6,000,000 suspension bridge being built across the Narrows near Tacoma. are entitled to additional compensation because of the velocity of tidal current at the bridge is greater than was specified in highway department plans, according to a ruling made last week by the Washington state attorney-general.

The attorney-general stated that the contractor had a right to rely upon actual tests of the tide velocity made by the state, and if he encountered a greater velocity, which required additional work, the contractor should then receive greater compensation. Velocity of the tides has made work difficult on the piers for the bridge. The bridge is being built for the Washington Toll Bridge Authority.

• • •

$2,000,000 Bridge Program Expected for Pennsylvania

A program calling for the construction or repair of more than 180 bridges on Pennsylvania roads at a cost of about $2,000,000 was announced Aug. 17 by I. Lamont Hughes, secretary of the Pennsylvania State Highway Department.

The program calls for work in virtually every county of the state and will be confined largely to the smaller structures on rural routes.

Approval by Governor James is necessary before actual work can begin.

• • •

New York Central Railroad Abandons 22 Miles of Track

The New York Central R. R. has received authorization from the Interstate Commerce Commission to abandon 21.9 miles of track in Greene and Ulster counties, N. Y. The line extending from Phoenicia to Kaatterskill, 19.2 miles, and that from Kaatterskill Junction to Hunter, 2.7 miles, will be taken out of service.

Air Conditioning Men To Be Licensed

An act passed by the 1939 legislature calling for the licensing and regulation of air conditioning contractors soon will be put into effect in North Carolina.

Designed to protect public health and safety, the law places the air conditioning industry under the jurisdiction of the state board of examiners for plumbing and heating contractors.

The first examination for applicants will be held in Raleigh August 29-30.

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Toll Collections Begin On New York Parkway

The collection of a 10c. toll per vehicle began on the Hutchinson River Parkway in Westchester Count, N. Y., Aug. 20. Collection was started after two members of the Automobile Club of New York were denied a temporary injunction in the state supreme court to stop collection of the toll.

However, the application for a stay of the collection of the toll was denied only on condition that the county issue to each toll payer a receipt to make possible return of toll collections in case the toll act eventually is declared invalidated. The court also ordered that the revenues from the toll be reported in a separate account pending final adjudication, which attorneys believe will be made by the state court of appeals in November.

Wide World

TVA BUYS TENNESSEE POWER CO. PROPERTY

WENDELL L. WILLKIE, president of the Commonwealth & Southern Corp., is shown receiving a check for $44,000,000 from David Lilienthal, TVA director, as the purchase of the Tennessee Electric Power Co., subsidiary of the Commonwealth & Southern, by TVA for $78,000,000 was completed. From left to right are: Jacob Hekma, vice-pres. of Commonwealth & Southern; Willkie; E. E. Nelson, secretary of the Commonwealth & Southern; Lilienthal; and L. J. Wilhoite, chairman of the Chattanooga Power Board.

The transfer is the largest of its kind in the history of public lighting utilities in the country, terminating six years of bargaining.

LABOR NOTES

OBJECTING to the plan of the CIO to invade the field of the building trades, the North Carolina Building and Construction Trades Council at a meeting in Raleigh last week adopted a program to resist such a move. The program was endorsed later by the 33rd annual convention of the North Carolina Federation of Labor. The latter organization also adopted a resolution criticizing labor conditions on North Carolina highway and public works commission construction projects. It declared that it had been unable to obtain definite statement of labor policy from the commission and attacked hours and wages under contracts let by the commission.

H. L. Kiser, of Charlotte, was re-elected president of the Building and Construction Trades Council. Other officers named were: Van R. Piendexter, Winston-Salem, secretary; A. T. Rust, Asheville, vice-president; and Pete Taffoli, Charlotte; H. H. Johnson, Asheville, and C. W. Green, Greensboro, members of the board of trustees.

THE FEDERAL COURT at Milwaukee has upheld the new Wisconsin Employment Relations Board in its first important ruling. In action arising out of the strike of a local CIO union at the Allen-Bradley Co. plant, the board ruled against mass picketing, and interference with workmen trying to enter the plant. It limited the number of pickets to 15 persons at any one time. The court's ruling now places the board in a position to enforce its demands against union officials.

• • •

Cloudburst Halts Traffic In New York Subway

A cloudburst, indirectly causing one death, halted traffic for nine hours on one line of the Independent Subway in the borough of Queens, New York City, Aug. 16. Traffic was also interrupted on numerous streets, and cellars and basements were flooded throughout an area of several blocks.

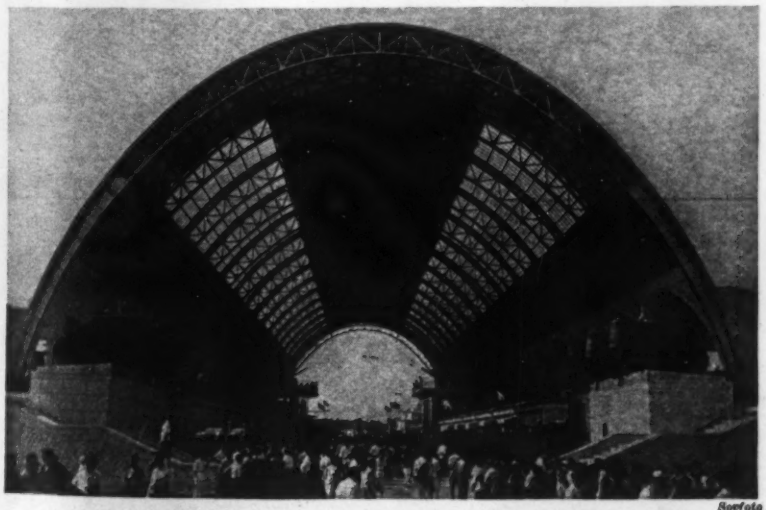
For a time telephone service and lights in some sections of the city were cut off when water pouring into manholes short-circuited wires. Some of the subway approaches to the Triborough Bridge were blocked. The storm covered an area of 12 sq. mi. No rain gages were located in the area affected.

A WPA worker seeking shelter under a platform supporting 250 bags of cement was killed when the platform collapsed due to undermining of its supports.

• • •

Kansas' Big Basin Flooded First Time in 15 Years

The Big Basin area four miles west of McPherson, Kan., once a swampy region and a haven for millions of waterfowl, is now flooded. The area, flooded for the first time in 15 years, is more than four miles long and two miles wide. Several farm homes are in the flooded area. A system of canals dug 23 years ago is expected to drain the entire area in a few weeks.



Soviet

PAVILION OPENED AT ALL-UNION EXHIBITION IN RUSSIA

EARLY this month the All-Union Agricultural Exhibition opened in Moscow, Russia. The pavilion "Mechanization of Agriculture," shown above, is the largest building on the 340-acre site. This structure is 500 ft. long and 160 ft. wide. It houses 300 different agriculture machines manufactured in Russia, the machines to move along on a belt conveyor for inspection.

Housing Loan Cut Curtails Planning

Failure of Congress to increase housing authority funds by $800,000,000 to be felt next year

Effects of the failure of Congress to act on the bill increasing by $800,000,000 the lending authority of the U. S. Housing Authority will begin to be felt early next year, USHA's statisticians expect, even though the next Congress passes the bill. Although only about $75,000,000 in actual cash has now been disbursed, the rate of disbursement is rising rapidly and is expected to reach a peak of about $32,000,000 per month in the middle of 1940. Thereafter disbursements will drop off rapidly, reaching $23,000,000 per month by the end of the year and decreasing nearly to zero by the end of 1941.

If the bill had passed at this session, USHA thinks, the rate of disbursement would have risen rapidly throughout 1940, flattening off in December to a $46,000,000 per month rate which would have been maintained throughout most of 1941.

If the additional lending authority is granted next year, little effect will be felt during 1940, but the sharp drop otherwise scheduled for 1941 will be checked in midsummer at an $18,000,000 level, and the rate will then rise for about a year.

Effect on construction contract awards will, of course, be greater, since these rise faster and drop off much faster than disbursements. Correspondingly, however, the effect of legislative action next spring would be felt sooner. To date, contracts totalling about $100,000,000 have been awarded.

• • •

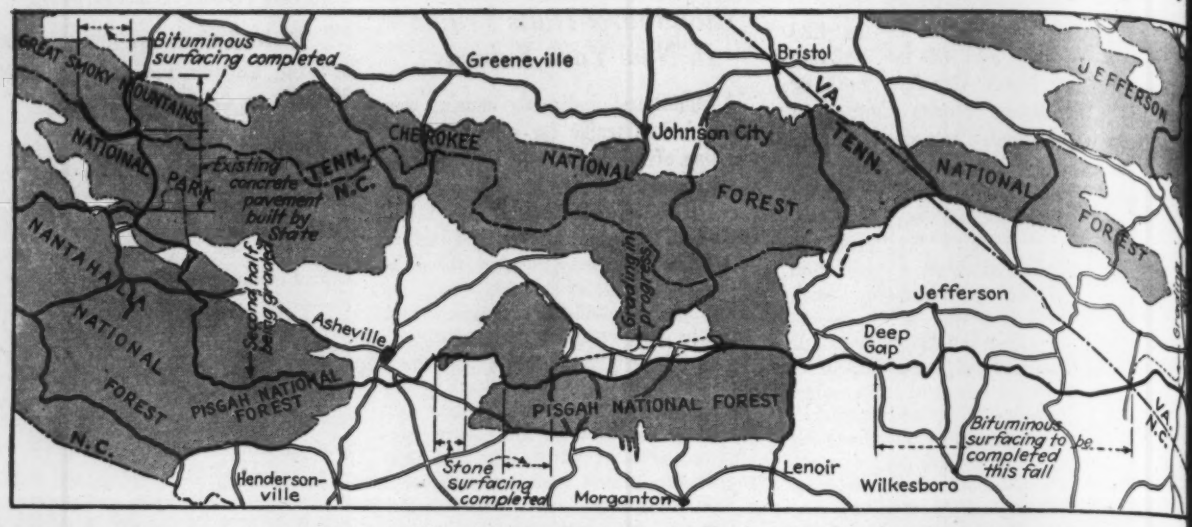
Memorial Proposed for Aqueduct Builder

As a tribute to William Mulholland, builder of the Los Angeles-Owens River aqueduct and head of the city's utility system for more than 50 years, the erection of a memorial fountain has been proposed. It would be built at the southeast corner of Riverside Drive and Los Feliz Boulevard in Los Angeles, the site where Mulholland lived during the '70s while he was employed as a laborer for the waterworks.

Plans for the fountain have been prepared by Walter Claberg, engineer in the structural design section of the Los Angeles Water Bureau. Approval of the design and site has been given by Mayor Fletcher Bowron.

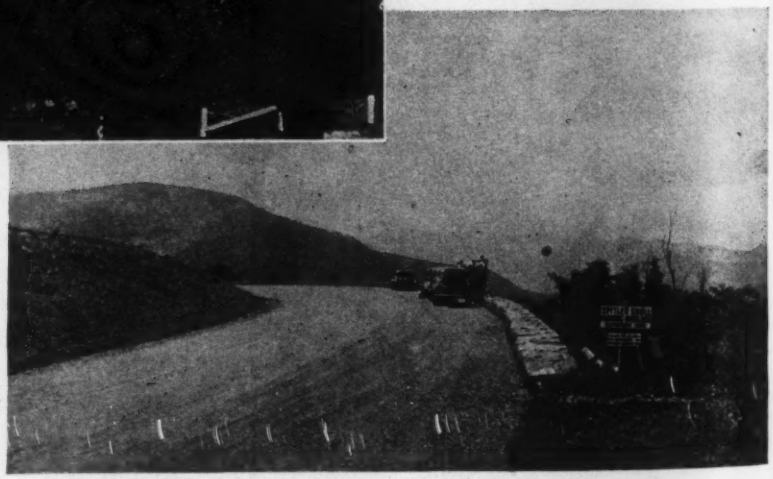
The fountain-construction is expected to receive city-wide acclaim.

The Blue Ridge Parkway



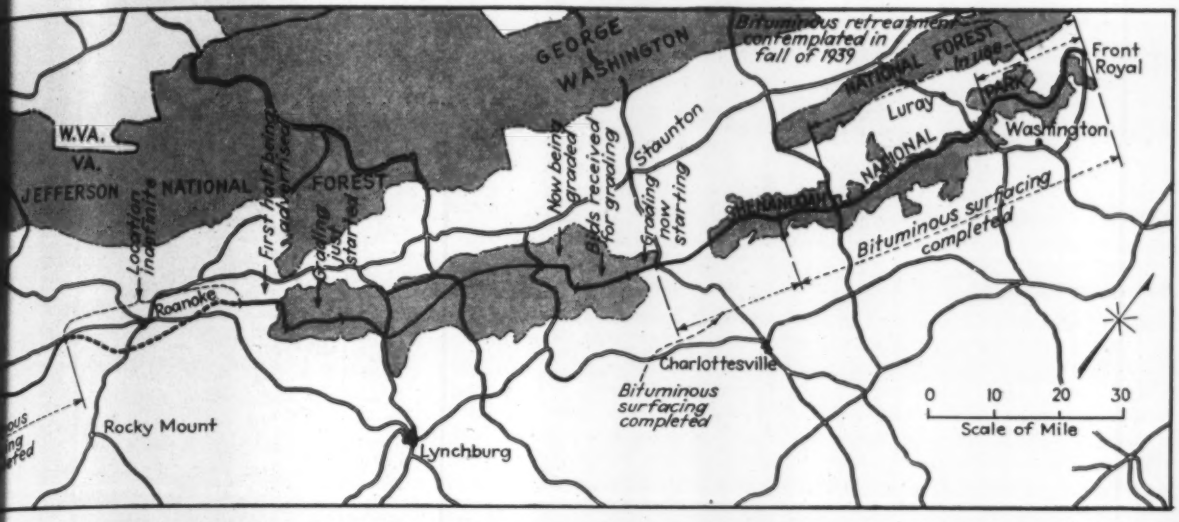
STARTING in 1932 as the Skyline Drive in Shenandoah National Park in Virginia (*ENR*, Aug. 7, 1932) the Blue Ridge Parkway is now a definitely planned pleasure drive extending as shown by the accompanying map from Front Royal, Va., 500 mi. to and across the Great Smoky Mountains in North Carolina and Tennessee. And, as the map also shows, great stretches of this road are completed or in various stages of construction, with the hope of completion in 1944. Nowhere has so great a scenic highway ever been planned, for it is the vision that finally it will traverse the eastern Appalachian highlands to the northern tip of the Green Mountains in Vermont (*ENR*, July 25, 1935)—a thousand miles of mountain drive. At present, about 160 mi. of the scenic boulevard have been

AN EYE TO SCENIC BEAUTY was used in selecting every part of the route but change of scene from sweeping views over mountain range and valley to the closer vision of roadside foliage and the waters of valley streams keeps the eye from becoming tired.



AND NEVER is the engineering requisite of safe and smooth travel sacrificed; 30 ft. of roadway, sturdy guardrail, reasonable curves and grades and a clear view ahead take the nerve strain away from mountain driving.

voted to Motoring Pleasure



completed in Virginia, including the Skyline Drive through Shenandoah Park. In North Carolina, more than 70 mi. are under construction in addition to the 60 mi. opened Aug. 1. Before it is completed the Parkway will cost an estimated $35,000,000. To date, the federal government has spent $16,000,000 on the road in North Carolina and Virginia, and the two states have put up several million dollars to obtain rights-of-way. The paved surface will be 20 ft. wide on 30-ft. roadway, and rights-of-way will vary in width from 50 to 100 ft. The National Park Service, which will administer the scenic drive, is also purchasing land along the right-of-way for camp sites, picnic grounds, recreational areas and hotels. The engineering work is being done by the Public Roads Administration.

RECREATION is the sole object; nowhere does the truck or other merchandise carrier interfere with the motorist's freedom; all roadside service is controlled by the National Park Service, and whether it be an afternoon picnic group. . . .

OR A PARTY OF HIKERS seeking the real forest wilds and eschewing the comforts of formal camps and commercial inns, the Park Service offers all the means needed for their chosen pleasure.

OBITUARY

ELDRIDGE E. CANDEE, 79, retired supervisor of the bridge and building division of the New Haven Railroad, died Aug. 11 in New Haven, Conn.

JAMES G. CAFFREY, former regional director FHA in Cleveland, was killed Aug. 11 in an automobile accident near Brooksville, Pa. He was 49 years old.

ORVILLE B. SKINNER, 72, consulting engineer, died Aug. 7 in Cleveland. As an associate with Pearson & Co., he once worked as a consulting engineer in Mexico establishing power houses and lines. Returning to the United States he built some of the first electric railways ever put in service in this country. He was a graduate of Massachusetts Institute of Technology.

JOHN A. GARCIA, 64, engineer and president of Allen & Garcia, consulting engineers, died Aug. 11 in Chicago. After graduating from the University of Missouri in 1900 with a mining degree, he worked on railway construction jobs in the West and on coal mining developments in Canada, Mexico and the United States. In 1927 he went to Russia as a consulting engineer and to Manchuria in 1930 as a consultant to the Japanese Government. The firm of Allen & Garcia was organized in 1911.

CARL LAGER, president of Morris Machine Works, Baldwinsville, N. Y., and a designer of pumping machinery, steam engines and hydraulic dredges, died recently at his summer home in the Adirondacks at the age of 70.

JAY C. BOYD, 64, civil engineer, died recently in Elm Grove, W. Va. For a number of years he was engaged as a civil engineer at Pittsburgh, Pa. In 1918 he went to Wheeling, W. Va., as an engineer for the Elm Grove Mining Co., remaining with that concern until 1929.

CLEMENT R. JONES, dean emeritus of the West Virginia University college of engineering, died Aug. 16 at the age of 68. He was appointed dean in 1911, after having served as professor and head of the department of mechanical engineering for ten years, and retired in 1932. He was a graduate of West Virginia University and had received a master's degree from Cornell University.

LOUIS R. BARRAS, construction engineer and former head of the Barras Construction Corp., New York City, died Aug. 14 in New York. Barras was 68 years old at the time of his death.

MARB B. REEVES, 68, builder who erected the Drexel Building in Philadelphia and several buildings at Lehigh University, died Aug. 15. For many years he was a member of the Stacy, Reeves & Sons, building and architectural firm in Philadelphia. At one time he was chief engineer of the Delaware & Short Line Railroad.

HENRY C. L. OPPERMAN, 91, retired contractor, died in Paxtang, Pa., recently. He supervised construction of the stone-arch Pennsylvania R. R. bridge across the Susquehanna River at Rockville, Pa., and built the waterworks system of Holmesburg, Pa.

FRANK S. CLEGHORN, 72, head of a Boston engineering firm bearing his name, died recently. A recent project of his firm was the Federal Building and Municipal Courthouse in Boston.

FRANK C. WARNER, former civilian engineer of the North Atlantic division of army engineers, died Aug. 19 at Delaware City, Del., at the age of 91. In 1881 he received a degree from the Sheffield Scientific School with the next year being spent in post graduate work at that school. In 1882 he began work on the location of a proposed extension of the Connecticut R. R., making maps and estimates for later construction. He had also worked for the New York & New England R. R. and for the New York & Connecticut Airline R. R. In 1887 he entered federal government service as an inspector. Later he was made assistant engineer and worked on fortification of the Delaware River.

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Chicago Utility to Spend $15,000,000 on Extensions

Having received assurance from President Coyne of the Building Construction Trades department at Washington that there would be no jurisdictional strikes on the work, the Commonwealth Edison Co. of Chicago has agreed to proceed with plant extensions costing $15,000,000.

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Public Health Engineering Course Added at M.I.T.

A graduate course in public health engineering will be offered this fall at Massachusetts Institute of Technology, Dean Samuel C. Prescott, head of the department of biology and public health, has announced. Subjects included are water supply and purification, sewerage and industrial waste disposal, stream pollution, sanitation of shellfish grounds and industrial hygiene.

Suit by Arthur E. Morgan Dismissed in Tennessee

Arthur E. Morgan's suit challenging the right of President Roosevelt to remove him as chairman of the TVA was dismissed Aug. 11 at Knoxville, Tenn., by Federal Judge George C. Taylor. In dismissing the suit, the judge held that President Roosevelt has the power of removal as an incident to the power of appointment.

The suit was filed in the Chancery Court at Knoxville July 6, 1938, and was transferred to the U. S. district court in August, 1938, on motion of TVA attorneys.

Morgan had maintained that the President was without authority to remove him "for the reason that such removal could be accompanied only by a concurrent resolution of the Senate and House of Representatives as provided in said (TVA) act."

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Washout in New Jersey Derails Express Train

Five cars of a passenger express on the Central R. R. of New Jersey, were derailed at Chatsworth, N. J., Aug. 19. Seventeen persons were injured, three seriously.

The train was derailed as a result of a rain washing out the road bed at a culvert, causing the tracks to drop several inches without breaking loose from the ties. The locomotive passed over the tracks at the culvert without mishap, but the tender and five cars were derailed. Roughly, 300 ft. of track was torn up.

The work of clearing up the wreck was delayed by a small dam failing and washing out about 35 ft. of trestle just to the north of the wreck.

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Default on Road Jobs in Mississippi Declared

The Sandy-Hites Construction Co. was recently declared in default on two highway jobs in Mississippi by the state highway commission. Bonding companies have taken over the work.

One project was construction of an underpass at Greenwood. On this work the contractor was ahead of schedule and well within the estimated cost of the job until heavy rains and a cave-in slowed up construction. The Central Surety and Insurance Corp. holds the performance bond.

The other project in default was on the highway between Holmes and Yazoo Counties. The bond on this work is held by the Standard Accident Insurance Co.

Ohio Commission Halted In Bridge Buying Program

A temporary restraining order to keep the Ohio Bridge Commission from purchasing any more bridges or disposing of any more revenue bonds until the rights of the commission are determined has been granted in the common pleas court of Franklin County, Ohio. The action was started by Joseph G. Russell of Cleveland Heights who said he was acting in behalf of taxpayers and users of toll bridges now operated by the commission.

It was pointed out to the court that the commission is authorized by law to purchase any spans desired and pay for them by the issuance of bonds. This, Russell contended, is a delegation of legislative power in violation of the constitution. Purchases can be made without conformity to any standards and without public hearings to determine value of the bridges, he further asserted.

James Metzenbaum, former Cuyahoga County Senator, stated, "As far as the act is concerned, there is not a standard or limitation. All the state bridge commission has to do is to find it expedient to purchase a bridge." Thus, he contended, the legislation establishing the commission was unconstitutional because it did not adequately define the commission's powers and did not place limitations on it as it did city and county bridge commissions.

The commission, which now operates four bridges, met recently and considered purchase of spans at Portsmouth and East Liverpool, Ohio, spanning the Ohio River. Such a purchase is now expected to be delayed for some time as it is not likely that the case will be heard for at least six months.

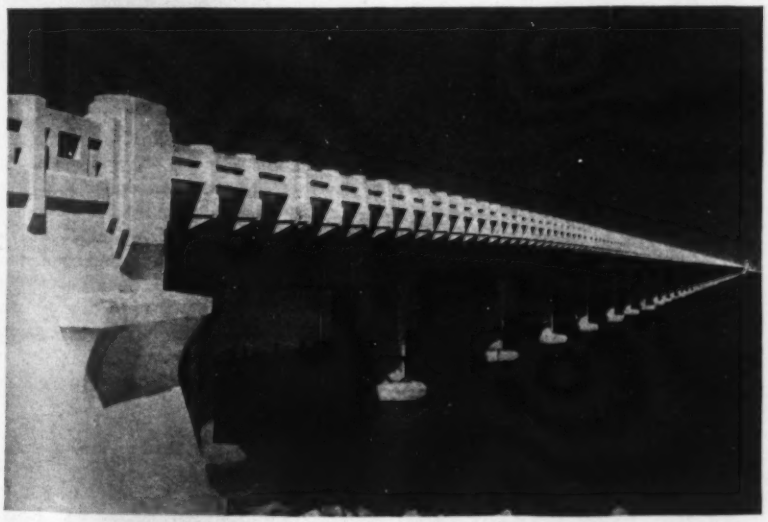
• • •

Nimrod Dam in Arkansas To Start in the Spring

Construction will begin early next spring on the $3,000,000 Nimrod Dam on the Fourche La Fave River in Perry county, Ark., according to Capt. Lee B. Washbourne, executive officer of the Little Rock, Ark., army engineers.

The dam will be a concrete gravity structure for flood control purposes, provision being made for future installation of hydro-electric power equipment. The capacity of the reservoir will be in excess of 300,000 acre-ft.

After suggesting that the crest of the dam might serve to carry a new highway bridge for State Highway No. 7, W. W. Mitchel, state highway director for Arkansas, has been informed by the army engineers that such a plan might be possible if the Arkansas department would construct approaches to the dam. A bridge now lies approximately one-half mile east of the dam site.



CAUSEWAY AT GALVESTON DEDICATED

DEDICATION of the new $2,500,000 concrete causeway across Galveston Bay, connecting Galveston with the mainland, took place Aug. 15. The reinforced concrete structure has four traffic lanes and is designed to withstand heavy wave action (*ENR*, Sept. 15, 1938, p. 327).

The length of the viaduct is 8,200 ft. and overall length of the entire improvement is two and one-fourth miles. The causeway, a PWA project, was designed by Terrell Bartlett, Engineers, San Antonia, Tex. T. J. Kelly of the Texas highway department has been supervising engineer of construction. Contract for the work was held by the Austin Bridge Co., Dallas, Tex., for which Jos. Grace was general superintendent.

Increased Efficiency Cited by PWA

PWA directors point out increased labor costs without corresponding increase of total costs

Increased efficiency of building labor in recent years is indicated by the experience of PWA regional directors. Gathered in Washington last week for their annual conference, the directors agreed that although labor rates have risen sharply since the 1933 beginning of the program, total costs have not risen as much as have been expected on the basis of labor's share of cost.

Total costs have risen most sharply in the past five years in the eastern states. One director mentioned an eastern city in which schoolhouses built in 1934 for 29c. per cubic foot now cost 36 to 37c. Moving farther west, the amount of increase falls off, until in the extreme northwest there has been practically no increase in costs.

Although unionization of construction labor has increased steadily during the period of PWA's operations, there has been little change in the frequency of labor disputes. In general, the directors felt that trouble has been least in areas where organization is well-established. Jurisdictional disputes have accounted for a large part of the difficulties.

The regional directors were also in agreement that there had been, particularly within the past year, a marked improvement in the quality of construction work in rural and small town areas. It is felt that PWA's rather rigid standards together with the technical assistance offered in the rural areas by the field inspectors have had a definite educational effect on contractors. One example given was the higher standards of schoolhouse fireproofing now current; PWA some years ago announced a policy of making no grants for non-fireproof school buildings.

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St. Louis Bridge Tolls Bring in $6,414,000

The tolls from the Municipal Bridge at St. Louis have given the city a total revenue of $6,414,000 during the past seven years, according to a report by the city comptroller. The toll was inaugurated July 21, 1932, to retire bonds totaling $8,200,000 which were issued to finance relief expenditures, the toll being 10 cents for pleasure vehicles and 15 cents for commercial vehicles.

The total collecting cost was $207,096, or slightly more than 3 per cent of the revenue. Records show tolls were collected from 41 million pleasure cars and 15 million commercial vehicles.

BRIEF NEWS

A public safety advisory committee of three has been appointed in Iowa. The committee will recommend state safety education projects and may appoint a public safety director or administrator to handle details of the program, the work to be financed by a special $31,200 legislative appropriation. Members of the committee, which was appointed by the Governor, are Karl W. Fischer, state public safety commissioner; W. Earl Hall, state safety council president; and M. C. Nelson, Des Moines safety council president.

A board of engineers is making a study of the feasibility of piping water 140 miles from the Illinois River in eastern Oklahoma to Oklahoma City, additional water being greatly needed for Oklahoma City. Rough estimates place the cost of the proposed project at $13,000,000. This would include a diversion dam near Gore, a pipe line with several pumping stations, an impounding lake near Oklahoma City, and connections to the present distribution system.

A federal allotment of $1,450,000 has been set aside for starting a $9,000,000 flood control project in Kansas, the work to be done by the army engineers. A series of dams will be built to control the several streams that combine to form the Kaw River, the first unit to start on the Smoky Hill river at Kanopolis, Kan.

A board, with a capital of $10,000,000 to construct aqueducts to various parts of the Abyssinian territory, will soon be appointed by the Italian Government. Construction of a water supply system for Asmara, Addis Ababa, Mogadisho, Harrar, Gimma, and Gondar is to be among the early projects. It is estimated that the present plan will be completed in four years.

Starting this fall, two $250 scholarships in welding engineering will be awarded at Ohio State University annually.

Colorado River Authority Sells Surplus Power

The Colorado River Authority of Texas has contracted with the Texas Power & Light Co. of Dallas and the Houston Power and Light Co. for the sale of surplus power from Buchanan, Inks, Marshall Ford and Tom Miller dams. The Dallas firm has contracted for 35,000 kw. of power, valued at approximately $700,000, and the Houston company has contracted for 15,000 kw. valued at approximately $200,000.

An important feature of both contracts is the provision that the authority can recapture each year part of the surplus power when it is required to serve public agencies which may ask for it in the future. The new contracts supplement those of the authority to sell power to the city of Austin and wholesale power to municipalities in the 16 counties served by the Pedernales Electric Cooperative.

Delivery of power under the contract with the Texas Power and Light Co. began on July 23 and, except for sales to the city of Austin.

MEN AT WORK

Mother nature gets pretty rough at times at the mouth of the Columbia River and tries to block the navigation channel. For years the army engineers have fought to keep the channel across the bar open by maintaining two long jetties, one on either side of the river. Now they are extending the north jetty and building another one on the north shore under the direction of **O. J. Hawkins,** resident engineer. Cap and cover stones weigh 25 tons each.

"It goes in here," says **Charles E. Donohue,** of the Donohue-Murphy Construction Co. of White Plains, N. Y. He is pointing to the charging hopper for the municipal garbage grinding plant at Goshen, N. Y., recently constructed by his company. The Goshen plant is the first in New York to employ garbage grinding combined with sewage treatment, and is one of the few in this country to adopt this new combination disposal scheme.

Walter B. Bushway, superintendent of the Brookline (Mass.) Water Board, casts a critical eye over his latest construction project. No, that isn't the Perisphere over his shoulder—it is the shell of a spheroidal water tank, the first structure of its kind to be installed for municipal water storage in this country. The spheroid tank was pictured on the July 27 cover of *Engineering News-Record* and will be fully described in the Aug. 31 issue.

New Jersey Court Acts On Treatment Plant Delay

Claiming the power of fining the taxpayers $1,000,000 and committing the individual defendants to jail for 100 years for ignoring a chancery court order directing the bureau of West Wildwood, Atlantic City, N. J., to construct a series of disposal plants, vice chancellor W. Frank Sooy of the New Jersey courts ordered three councilmen and two former councilmen of the bureau to appear for sentence Aug. 22. When that date came the actual sentence was $50 for the councilmen and $250 for the municipality.

An order was obtained by the New Jersey State Board of Health in 1934 ordering the construction of a sewage treatment plant. Becoming involved in politics, no action was taken by the city council before July 25, the last date to which the order had been extended. Hearing the case, the vice chancellor stated "The borough or the taxpayers are responsible for the acts of its councilmen and cannot escape because the councilmen did not do their duty."

Later he explained that he could not put a municipality in jail but theoretically could fine its taxpayers $1,000,000 and commit the individual defendants to jail for 100 years.

"With the decree staring them in the face and the community endangered by an unhealthy condition, they did nothing but try to sell a bond issue when the probability was there would be no buyers.

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$20,000,000 Housing To Start in New York

Following adoption of a formula by the AFL aimed at eliminating work stoppages because of inter-union jurisdictional disputes (*ENR*, Aug. 17, p. 195), Mayor La Guardia of New York City Aug. 16 issued orders to proceed on $20,000,000 of new housing projects.

Five projects to house 4,000 families have been held up for several weeks awaiting assurance by the unions that they would not stop work because of inter-union disputes. The mayor had taken the position that jurisdictional strikes were costly to the taxpayers and resulted in increasing the cost of publicly financed housing projects. Without definite assurance that these costs would not be increased by labor troubles of the city's control, he was unwilling to proceed with further construction. The projects include Vladeck Houses and Vladeck City Houses in the Corlears Hook section of Manhattan and South Jamaica Houses in Queens. The names of the other two projects have not been announced.

TVA Utility Purchase Speeds Construction Work

As a direct result of the termination of the controversy between the TVA and the Commonwealth & Southern Corp., settled last week when TVA and associated municipalities of Tennessee purchased the electric facilities of the Tennessee Electric Power Co., the Commonwealth & Southern will begin immediately an additional construction program of $16,000,000, according to Wendell L. Wilkie, president of the company.

TVA officials also signed a contract with the corporation for the sale of electric power to the Alabama Power Co. system, largest remaining Commonwealth & Southern subsidiary in the Southeast.

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Reclamation Calls for Bids On Long Tunnel

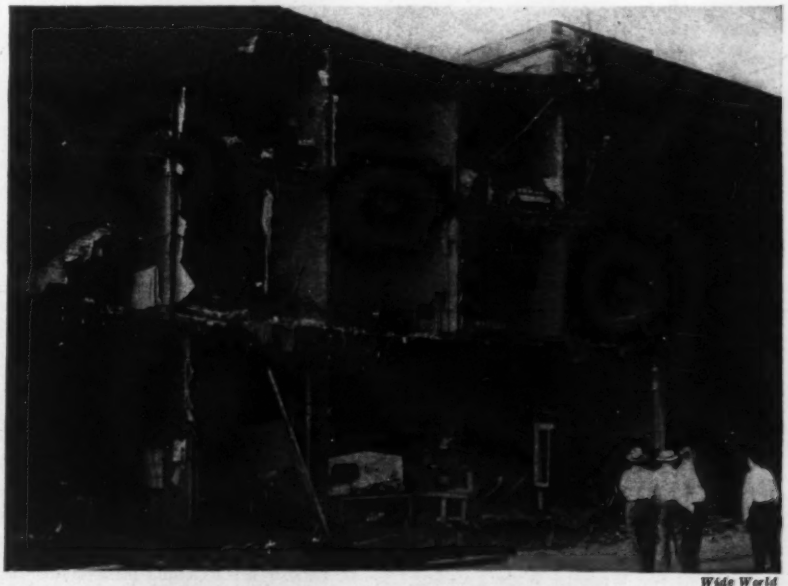
A call for bids on a tunnel 68,980 ft. in length, has been issued by the U. S. Reclamation Service, bids to be openened on Aug. 29 at Denver, Colo. The west portal of the tunnel will be at Grand Lake on the western slope of the continental divide and the eastern portal on the eastern slope near Estes Park. It will be circular in section, having an inside diameter of 9 ft. 9 in., and will be lined with concrete. The tunnel is part of the Colorado-Big Thompson project.

WASHINGTON HIGHLIGHTS

Special reports by Paul Wooton

THE PUBLIC WORKS Administration, which last week announced its intention of cutting its staff in half by the year end (*ENR*, Aug. 17, 1939, p. 37), is consolidating the Portland regional office with the San Francisco office, leaving only the latter office. Subregional offices at Harrisburg, Pa., and Columbus, Ohio, are also being abolished, their work being transferred to the New York and Chicago offices, respectively. No announcement has yet been made as to the disposition of personnel at these offices.

PROPOSED CHANGES in the District of Columbia building code are now being presented for comment to building interests in the district. After suggestions received have been considered by the building department, the changes will be submitted to the board of district commissioners for action. This will be the first major change in the code since 1925, although minor revisions were made in 1930. Chief change is the increase of design stress in structural and intermediate (reinforcing bar) steel from 18,000 lb. per sq.in. to 20,000 lb., conforming to the standards of the A. I. S. C.



Wide World

BREAK IN STORM SEWER WRECKS BUILDING

WHEN a 6 x 8 ft. brick storm sewer burst recently in Des Moines, Ia., following a sudden 2-in. rain, $20,000 damage to an apartment building resulted. Water washed away foundation soil causing a large section of the outer wall to collapse. The street was also damaged, total being $50,000.

MEN AND JOBS

W. S. MILES, civil engineer, has joined the municipal department of the Peacock Brothers, Ltd., of Montreal, going to their Toronto office. In the past he has worked in the county engineer's office at Goderich, Ont., and on the construction of the Queenston plant of the Hydro-Electrical Power Commission.

E. F. MARSTON, assistant district highway engineer at Fort Frances, Ont., is being transferred to Sudbury, Ont.

H. R. MACKENZIE has been made deputy minister of highways for the Province of Saskatchewan, Canada.

CHARLES R. LOVE and H. ALVA EDWARDS have been named to fill vacancies on the Kokomo, Ind., Housing Board.

E. P. PALMER, past president of the Associated General Contractors of America and at present a director of the U. S. Chamber of Commerce, has been appointed chairman of the construction and civic department committee of the chamber.

H. C. MCKEAN, formerly city engineer at Iowa Falls, Iowa, and later employed at Spencer, has been appointed city engineer at Grinnell.

VLADIMIR KARAPETOFF, professor of electrical engineering at Cornell University, retired in June and has been made professor emeritus by the board of trustees. Born in Petrograd, Russia, in 1876, he received a civil engineering degree at the Imperial Institute of Ways of Communication in 1897 and came to America in 1902.

FRANK JOHNSON, resident engineer with the Iowa State Highway Commission and located at Estherville, has been transferred to Humboldt on a bridge construction project, the Estherville district office being closed.

HAROLD H. CULLEN, Crisfield, Md., last week begun new duties as road engineer for Somerset County, Md. His office will be at Salisbury.

E. C. HARDING, PWA project manager for $10,000,000 of construction in Kentucky, has resigned to accept a position as vice-president and chief engineer of the Western Waterproofing Co. of Cincinnati.

CLAUDE L. CORAY, former Ogden, Utah, city engineer and associate civil engineer and superintendent of construction at the Ogden army ordnance depot for one year, is now working on construction of a new army air base at Fairbanks, Alaska. His new duties will be those of civil engineer and superintendent of construction.

CHARLES S. CHRISTIAN, of Little Rock, Ark., and former state highway engineer, has been chosen engineer for the Arkansas State Flood Control Commission. He will compile data on several flood control projects for presentation to the flood control committee of the House of Representatives when Congress reconvenes next January. Projects being studied are: Bayou Meto, Saline River, Caddo River, Little Missouri River, Cadron Creek, Spring River, Cache River and Rolling Ford River.

LEWIS H. TUTHILL, former testing engineer for the Metropolitan Water District of Southern California, is now employed by the U. S. Bureau of Reclamation in the Denver offices. A frequent contributor to the Journal of the American Concrete Institute, he will be employed in the testing and control laboratories.

CHARLES R. PETTIS, retired colonel of the army engineers, has been made a members of the faculty of Mississippi State College, State College, Miss., to head the department of mathematics.

BEN S. MORROW, for many years chief engineer of the water bureau of Portland, Ore., and since 1934 general manager, is now city engineer for Portland. He succeeds L. G. APPERSON, who has held that position since 1933, resigning recently to become chief of the city's bureau of construction. Apperson had a great deal to do with Portland's street-widening program. Morrow, who started his work with the bureau in 1909, had charge of the construction of the $2,000,000 Bull Run Dam for Portland's water supply system. He is also a member of an engineering board to consider possible construction of a new sewage disposal unit for the city. Other members of the board are: ABEL WOLMAN, chief engineer of the Maryland State Board of Health; WELLINGTON DONALDSON of New York; R. H. COREY, consulting civil engineer of Portland; and Carl Green, sanitary engineer, Oregon State Board of Health.

D. GRANT MICKLE has been made director of the newly created division of traffic and safety with the Michigan State Highway Department. This division will have supervision over signs and signals on trunk lines; conduct traffic studies; collect and analyze accident data; and assist municipalities in traffic control. Other changes in the Michigan department are: W. W. McLaughlin is to head the testing division; J. W. KUSHING, to act as director of the research division; J. G. SCHAUB becomes engineer of construction and operations; H. J. CONROY of Battle Creek has been promoted to district engineer with headquarters at Saginaw to replace JOSEPH E. WILBUR, who was transferred to Crystal Falls; H. C. BACON, district engineer at Plymouth, having been transferred to Newberry to take the place of J. B. MCKEVITT, resigned; and FRED C. TAYLOR is to head the highway planning division, formerly the highway planning survey headed by Taylor.

WALTER A. RAMSEUR, chairman of St. Petersburg, Fla., Housing Authority, recently was elected president of the Florida Association of Housing Authorities at their annual meeting. L. DALEZENT of West Palm Beach was elected secretary-treasurer.

MEETINGS

FIFTH International Conference on Timber Utilization, Zurich, Switzerland, Aug. 29–31.

BRITISH-AMERICAN ENGINEERING CONGRESS, New York City, Sept. 5–8, the American Society of Civil Engineers, American Society of Mechanical Engineers, Institution of Civil Engineers, Institution of Mechanical Engineers, and Engineering Institute of Canada participating.

MONTANA NATIONAL BITUMINOUS CONFERENCE, Sun Valley, Idaho, Sept. 11-15.

AMERICAN SHORE AND BEACH PRESERVATION ASSOCIATION, annual summer meeting, New York City, Sept. 11-12.

AMERICAN CHEMICAL SOCIETY, div. of water, sewage and sanitation chemistry, Boston, Mass., Sept. 12-14.

FEDERATION OF ARCHITECTS, ENGINEERS, CHEMISTS AND TECHNICIANS, Federation Day at the Fair, World's Fair Grounds, New York City, Sept. 16.

WATER CONSERVATION DAYS group, annual program, Miles City, Montana, Sept. 15-16.

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS, Richmond, Va., Oct. 9-13.

PUBLIC WORKS CONGRESS, annual meeting, Pittsburgh, Pa., Oct. 9-11.

AMERICAN PUBLIC HEALTH ASSOCIATION, annual meeting, Pittsburgh, Pa., Oct. 17-20.

AMERICAN SOCIETY OF SAFETY ENGINEERS, annual meeting, Atlantic City, N. J., Oct. 18.

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, fall meeting Atlanta, Ga., Oct. 30-31.

REGIONAL AND LOCAL

MINNESOTA Section, A.W.W.A., Duluth, Aug. 24-25.

AMERICAN SOCIETY OF CIVIL ENGINEERS, seventh district's second annual meeting, Michigan College of Technology, Houghton, Mich., Aug. 24-26.

NEW ENGLAND WATER WORKS ASSOCIATION, annual convention, Hotel Windsor, Montreal, Sept. 12-15.

SOUTH DAKOTA WATER AND SEWAGE WORKS CONFERENCE, fifth annual meeting, Rapid City, Sept. 14-15.

NORTH DAKOTA WATER AND SEWAGE WORKS CONFERENCE, Dickinson, N. D., Sept. 22-23.

NORTHERN MICHIGAN COUNTY ROAD COMMISSIONERS ASSOCIATION, annual meeting, Traverse City, Mich., Sept. 28-29.

AMERICAN WATER WORKS ASSOCIATION, section meetings: Minnesota, Duluth, Aug. 24-25; West Virginia, Morgantown, Sept. 27-29.

AMERICAN WATER WORKS ASSOCIATION, Four States section, annual meeting, Reading, Pa., Oct. 5-6.

CENTRAL STATES SEWAGE WORKS ASSOCIATION, annual meeting, Chicago, Ill., Oct. 12-13.

AMERICAN WATER WORKS ASSOCIATION, Southwest Section, annual meeting, Dallas, Tex., Oct. 16-19.

AMERICAN WATER WORKS ASSOCIATION, New Jersey section, fall meeting, Atlantic City, N. J., Oct. 20-21.

AMERICAN WATER WORKS ASSOCIATION, California section, annual convention, San Francisco, Oct. 25-28.

CIVIL SERVICE EXAMINATIONS

CANADA: Senior draftsman, Dom. Dept. of Agr., Ottawa, $1800; senior map draftsman, Dom. Dept. of Agr., Ottawa, $1800; map draftsman, Dept. of Mines and Resources, Ottawa, $1500. Candidate must be British subject, having resided in Canada for five years. Applications with Civil Service Commission, Ottawa, by Sept. 5.

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License Examinations

IOWA: Examinations for professional engineering, Sept. 19-20; for land surveyor, Sept. 21, at the State House, Des Moines.

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El Azucar Dam Work Being Hurried

Placing of 225,000 cu. yd. of reinforced concrete has been completed by the Mexican government at the El Azucar dam on the San Juan River, a tributary of the Rio Grande. The project is to irrigate 250,000 acres in the states of Tamaulipas and Nuevo Leon bordering Texas. The ministry of communications and public works, which is building the dam, is endeavoring to complete it by the end of 1940.

* * *

Road Resurfacing Program Started in Pennsylvania

A highway resurfacing program, involving an expenditure of $2,500,000 has begun in Pennsylvania. The program comprises 107 projects covering 150 miles of roadway, 46 jobs to be done by contracts and the remaining 61 to be handled by the department's maintenance forces.

Bids for some of the work were opened August 18 and the state's department of property and supplies is scheduling bids for large quantities of stone, gravel and bituminous material to be used by the highway forces.

President Disapproves Choice of Projects

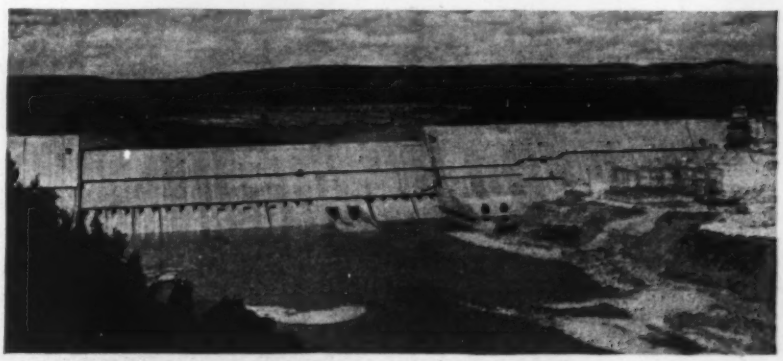
Desires well-considered and well-rounded plan for river and harbor projects

The President has utilized a routine river and harbor survey authorization to express his disapproval of the current system for choosing river and harbor projects. In a message accompanying a veto of the bill, he said that "there should be a well-considered and well-rounded plan for projects to be undertaken in a definite order of human and national preference and desirability instead of putting them only on a local geographical basis."

The vetoed bill would have authorized the Chief of Engineers to make preliminary surveys of a considerable number of projects; it also authorized changes in a number of projects on which construction has already been authorized, and authorized construction of a new project at Oswego Harbor, N. Y. It authorized one flood control project which is also authorized in identical terms by this year's flood control authorization bill; this last was introduced into the present bill at a time when it appeared the flood control bill might not pass.

Drawing attention to the large number of projects and surveys now authorized, the President said that "I think it is time to go more slowly in the examination and authorization of these river and harbor projects."

A second objection to the bill was lack of a clause recognizing the right of the Federal Power Commission to examine projects for potential power possibilities.



HEIGHT OF MARSHALL FORD DAM TO BE INCREASED

THE HEIGHT of Marshall Ford Dam on the Colorado River of Texas near Austin will be increased by 78 ft. to a total height of 270 ft., Congress during its last session having approved the second stage development. A power plant having 3 units, each 20,000 kw in capacity, will also be constructed. The dam, being built by the Bureau of Reclamation, is for flood control, power, and river regulation for navigation purposes.

Right-of-Way Fight Believed Ended

The fight to obtain a right-of-way for the construction of the Blue Ridge Parkway through the Cherokee Indian reservation in western North Carolina is believed to be ended following a proposal by the Indians whereby they would yield property for the project.

The proposal, made at a conference at Asheville, N. C., Aug. 9, between the Indians, representatives of North Carolina highway and public works commission, and a representative of the United States Senate Committee on Indian Affairs, provides for a payment of $30 per acre for right-of-way land, with a minimum payment of $40,000.

The parkway would be connected with existing state routes at Ravensford and Soco Gap, and the Soco Gap road in the Indian reservation would be extended to Cherokee. A survey of the proposed route would be made immediately in order that a definite route may be agreed upon and submitted to the tribal council for the conveying of easements.

The Indians also ask that concessions along the right-of-way through the reservation be prohibited and that the $40,000 minimum purchase price be deposited in U. S. Treasury to be held in trust for the Indians at 4 per cent interest pending the making of the payment.

Prior to the conference, (*ENR*, Aug. 3, p. 36), the Indians had stubbornly refused to premit the ceding of a right-of-way for the project. Because of this, at the last session of Congress, a bill was introduced giving North Carolina officials the right to condemn land for the parkway. The bill passed the House but was held up by the Senate Committee on Indian Affairs in order that attempts might be made to settle the differences.

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TVA May Condemn Land As Quarry Site

The TVA has the right to condemn land for use as a quarry from which to obtain stone for construction of the Gilbertsville Dam project in Kentucky, according to a recent ruling of the U. S. district court of the western district of Kenutcky.

The question was raised by the land owners in an amended answer to a TVA condemnation suit, the land owners claiming that the sole purpose for condemnation of their property was to obtain stone and that this was beyond the authority of the government.

The land will not be flooded when the reservoir is filled.

Galveston County Court Names Tunnel Consultant

The commissioners court of Galveston County, Tex., has appointed the engineering firm of Wilberding & Palmer, Washington, D. C., as consultant engineers for the projected tunnel from Galveston Island to Port Bolivar.

"The court has considered and determined that public necessity demands that a toll vehicular tunnel be constructed from Galveston Island under Galveston Bay to Port Bolivar," was part of the court's resolution in appointing the consulting firm. The firm has been directed to prepare the necessary plans and specifications, make traffic studies, arrange for loans, and make all other necessary arrangements for the work to be started.

An appropriation of $3,000 was made by the commissioners for borings to be made on the site of the proposed tunnel, the cost of the work being estimated at $8,500,000.

C. C. Washington, engineer of Galveston County, recently submitted plans to the court for a tunnel which would provide a 24-ft. roadway and 5 ft. of sidewalk with the overall length of tunnel 6,200 ft. His plans called for construction in an open channel.

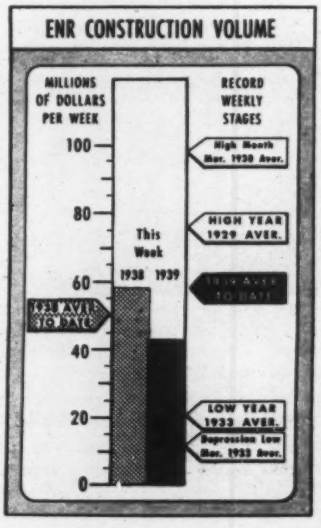
CONTRACTS AND CAPITAL

ENGINEERING construction awards for the week, $43,950,000, are 24 per cent below the corresponding 1938 week, and 28 per cent under last week.

The construction volume for 1939 to date totals $1,965,406,000, a 15 per cent increase over the $1,710,035,000 reported for the initial 34-week period in 1938.

Private construction for the week is 4 per cent higher than in the 1938 week, but is 52 per cent below the high volume of a week ago. Public awards are 30 and 14 per cent lower, respectively, than last year and last week.

Waterworks awards reached the third highest weekly level of the year due to the $15,486,000 award for Lackawack Dam, a New York Board of Water Supply Delaware Aqueduct project. Commercial building and large-scale private housing is also above the preceding week. These two classes of work are also higher than in the week a year ago.



New capital for construction purposes for the week, $15,061,000, is 67 per cent lower than a year ago, when PWA allotments boosted the total. This week's financing is made up of $10,707,000 in corporate security issues, and $4,354,000 in state and municipal bonds.

New construction financing for the year to date totals $2,137,541,000, a decrease of 22 per cent from the $2,738,859,000 for the corresponding 34-week period last year.

CONTRACTS

(Thousands of dollars)

	Week Ending Aug. 25 1938	Aug. 17 1939	Aug. 24 1939
Federal	$17,861	$6,719	$3,702
State & Municipal	29,672	31,782	29,500
Total public	$47,533	$38,501	$33,202
Total private	10,374	22,350	10,748
TOTALS	$57,907	$60,851	$43,950
Cumulative 1939 (34 weeks)			$1,965,406
1938 (34 weeks)			$1,710,035

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1938 34 Wk.	1939 34 Wk.
NON-FEDERAL	$1,594,917	$1,009,513
Corp. securities	268,192	163,506
State & Mun.	382,355	401,855
R.E.A. loans	11,629	89,445
R.F.C. loans	96,891	3,855
P.W.A. allot.	479,822	.....
U.S.H.A. loans	154,528	160,852
Fed. Aid—Hwys.	201,500	190,000
FEDERAL	$1,143,942	$1,128,028
TOTAL CAPITAL	$2,738,859	$2,137,541

FHA MORTGAGES

	Week Ending Aug. 20 1938	Aug. 12 1939	Aug. 19 1939
Selected for appraisal	$22,326	$20,896	$23,670*
Cumulative 1939 (33 weeks)			$744,570*
1938 (34 weeks)			$623,973

* Subject to revision.

ENR INDEX NUMBERS

		1913	1926
Construction Cost	Aug.	234.90	112.92
Building Cost	Aug.	196.54	106.24
Volume	July	166	73

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

FLOOD WALL, MASSACHUSETTS

OWNER: U. S. Engineer Office, Industrial Trust Bldg., Providence, R. I. Lieut. Col. J. S. Bragdon, engineer.

PROJECT: Constructing reinforced concrete flood wall 5,020 ft. long, ranging from 9 to 37-ft. high, located on west bank of Connecticut River in east portion of Holyoke, Mass. Includes construction of 9 tailrace structures, 5 stop-log structures, 4 pumping stations, steel sheet piling cut-off, and earth dike.

CONDITIONS: Several mill tailraces must be cofferdammed and water diverted. Existing sewerage system to be intercepted and sewage diverted. Railroad sidings to be supported and relocated. Project to be completed with minimum interference to operation of manufacturing plants and utilities. Contractor to furnish all material except pumping station equipment which will be furnished by owner. Railway and highway transportation available. Stipulated contract time, 450 calendar days. Labor rates: skilled, $1.25 to $1.65½ per hr.; semi-skilled, 62½ to 75c.; and common, 65c. per hr.

BIDS: Four bids received June 13, 1939, ranging from contract low of $886,403 to $952,125. Engineer's estimate $899,142.

LOW BIDDERS:

1. Daniel O'Connel's Sons, Inc., Holyoke, Mass. (contract) $886,403
2. J. F. Fitzgerald Constr. Co., Boston, Mass... 892,090
3. Arthur A. Johnston Corp., Long Island City, N. Y. 938,463

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Prepare site	5 ac.	$282.00	$300.00	$200.00
2. Control, divert water and sewage	L. S.	49,000.00	75,000.00	65,000.00
3. Support railroad tracks	L. S.	27,590.00	15,000.00	44,000.00
4. Com. excav. general	59,000 c. y.	1.72	1.00	1.40
5. Impervious borrow excav	2,200 c. y.	.60	1.00	.50
6. Random borrow excav	1,200 c. y.	.57	.60	.40
7. Trench excav	3,200 c. y.	1.41	1.00	2.40
8. Rock excav	250 c. y.	9.00	5.00	17.00
9. Sheeting, timber	100 M. ft.	90.00	60.00	100.00
10. Sheeting, steel	16,000 s. f.	1.35	.90	.76
11. Steel sheet piling	136,000 s. f.	.90	1.00	.90
12. Imperv. fill, place and roll	2,200 c. y.	.27	.20	.23
13. Random pervious fill	2,400 c. y.	.28	.20	.18
14. Gravel bedding	2,600 c. y.	2.72	3.00	3.60
15. Random backfill	39,000 c. y.	.36	.25	.17
16. Rock fill	500 c. y.	2.37	3.00	2.50
17. Riprap, hand-placed	550 c. y.	5.00	4.00	7.35
18. Riprap, grouted	40 c. y.	11.20	6.00	9.60
19. Rubble masonry	400 c. y.	17.00	4.00	12.00
20. Rock for drains	900 c. y.	3.80	5.00	2.75
21. 8-in. vit. cl. pipe (open jt.)	100 l. f.	.65	.45	.50
22. 10-in. vit. cl. pipe (open jt.)	100 l. f.	.80	.60	.65
23. 12-in. vit. cl. pipe (open jt.)	1,300 l. f.	.95	.80	.85
24. 15-in. vit. cl. pipe (open jt.)	160 l. f.	1.36	1.15	1.30
25. 18-in. vit. cl. pipe (open jt.)	180 l. f.	1.86	1.65	1.80
26. 18-in. vit. cl. pipe (mortar jt.)	310 l. f.	1.83	1.80	2.00
27. 24-in. vit. cl. pipe (mortar jt.)	200 l. f.	2.96	3.00	3.15
28. 8-in. V. C. pipe, perf. (open jt.)	50 l. f.	.88	.60	.70
29. 30-in. rein. conc. pipe	1,570 l. f.	4.57	3.80	4.50
30. 36-in. rein. conc. pipe	140 l. f.	5.75	4.60	6.00
31. 48-in. rein. conc. pipe	30 l. f.	9.60	8.00	11.00
32. 8-in. c. i. pipe (open jt.)	220 l. f.	1.85	2.00	1.50
33. 12-in. c. i. pipe (open jt.)	40 l. f.	2.93	3.00	2.70
34. 18-in. c. i. pipe (open jt.)	100 l. f.	5.20	5.00	5.00
35. 18-in. c. i. pipe (caulked)	36 l. f.	5.68	6.00	5.50
36. 30-in. c. i. pipe (caulked)	40 l. f.	12.60	10.00	11.00
37. Cement	27,400 bbl.	2.68	2.50	2.50
38. Cl. A concrete	11,400 c. y.	15.30	13.80	15.00
39. Cl. B concrete	10,450 c. y.	6.30	9.00	10.00
40. Reinforcing steel	2,320,000 lb.	.0354	.05	.035
41. Pumping station features	L. S.	2,760.00	3,000.00	5,200.00
42. Tailrace gates and accessor	194,000 lb.	.20	.14	.20
43. Tailrace ga . hoists	16 pr.	870.00	1,100.00	1,500.00
44. Sluice gates and hoists	4 ea.	790.00	1,000.00	1,000.00
45. Traveling crane, incl. girders and side rails	4 ea.	805.00	1,000.00	1,500.00
46. Misc. iron and steel	100,000 lb.	.104	.13	.10
47. Misc. blk. steel pipe	7,800 lb.	.28	.30	.15
48. Copper water stops	3,700 lb.	.54	.40	.50
49. Electr. light system	L. S.	1,760.00	2,500.00	4,000.00
50. Fibre conduit	6,000 l. f.	.37	.40	.33
51. Lead cov. cable, 250 M.C.M	500 l. f.	1.74	1.80	2.00
52. Lead cov. cable, 000 A.W.G	4,000 l. f.	1.10	1.20	1.45
53. Lead cov. cable 0 A.W.G	2,900 l. f.	.84	.85	1.25
54. Lead cov. cable, 6 A.W.G	200 l. f.	.64	.50	1.00
55. Pull boxes	7,800 lb.	.32	.30	.40
56. In-tal. equip. furn. by Gov't	L. S.	2,100.00	6,000.00	5,000.00
57. Inst. misc. pipe and fittings	500 l. f.	2.80	4.00	1.00
58. Inst. misc. gate valves	17 ea.	45.00	100.00	15.00
59. Timber stop-logs	16 M ft.	133.00	150.00	125.00
60. Topsoil, embankment	600 c. y.	1.70	1.00	2.00
61. Sod and seed	.4 ac.	282.00	500.00	500.00
62. Surf. top of dike	60 c. y.	2.50	3.00	3.00
63. Surfacing, roads	100 c. y.	2.24	3.00	3.50
64. Bitum. macadam road surf	700 s. y.	1.87	2.00	.80

BRIDGE APPROACH, KENTUCKY

OWNER: Owensboro Bridge Commission, Owensboro, Ky.; Modjeski and Masters, consulting engineers, Harrisburg, Pa.

PROJECT: Indiana approach to Owensboro vehicular bridge across Ohio River. Consists of compacted earth fill, concrete pavement, gravel shoulders 3.5 miles long, extending north from Indiana abutment of Ohio River Bridge. Two reinforced concrete bridges, each 510 ft. long, one box culvert and tile drains, for drainage purposes.

CONDITIONS: Transportation by rail delivery two miles distant, by water ½ mile distant, and by highway at site. Minimum labor rates: Skilled, $1.50, $1.25 and $1.10 per hr.; semi-skilled, $1.00 per hr.; and common, 50¢ per hr.

BIDS: Eleven bids were received July 11, 1939, ranging from the contract low of $412,738 to $524,773.

LOW BIDDERS:

1. J. C. O'Connor & Sons, Fort Wayne, Ind. (contract) $412,738
2. J. B. Michael & Co., Memphis, Tenn..... 421,670
5. John F. Bloomer & Sons, Appleton, Wis..... 431,338

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clear site and borrow pit	L. S.	$5,575.00	$7,500.00	$12,900.00
2. 24-in. tile dr., excav., backfill	700 l. f.	2.00	3.50	3.50
3. 36-in. tile dr., excav., backfill	400 l. f.	4.75	6.00	5.00
4. Conc., culv. and wingwalls	310 c. y.	20.50	19.00	21.00
5. Borrow excav., in compact. fill	750,000 c. y.	.185	.23	.22
6. Conc. paved gutters	1,950 s. y.	3.50	2.00	3.00
7. Riprap	7,000 s. y.	1.88	2.25	1.60
8. Reinf. conc. pavement	40,800 s. y.	1.94	2.04	2.05
9. Expansion joints	3,200 l. f.	.56	.37	.30
10. Contraction joints	6,100 l. f.	.28	.15	.16
11. Grav. surf., shoulders, ramps	43,000 s. y.	.75	.45	.84
12. Guide posts	1,550 ea.	1.35	1.75	1.10
13. 20-in. conc. piles	7,200 l. f.	5.98	5.30	4.00
14. Conc. in pile cap beams	310 c. y.	22.00	17.00	22.00
15. Conc. in br. stringers, road slabs and curbs	1,445 c. y.	28.45	22.00	25.00
16. Conc. railing and posts	2,044 l. f.	3.91	2.65	3.00
17. Reinforcing steel	450,000 lb.	.0425	.04	.042
18. Misc. metalwork	17,500 lb.	.21	.30	.30

HIGHWAYS COLORADO

OWNER: Colorado State Highway Department, Denver. Charles D. Vail, State Highway Engineer.

PROJECT: Gravel surfacing, grading and drainage of 9.593 miles of highway between Wheeler and Dowd, Summit and Eagle Counties, Colo. Width 26 ft., for 24 ft. surfacing.

(Contract Unit Prices continued on page 15)

CONSTRUCTION REPORTS

Compiled by BUSINESS NEWS DEPARTMENT
Engineering News-Record, 330 W. 42nd St., New York
ELSIE EAVES, MANAGER
(Daily service also available—Write for details)

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

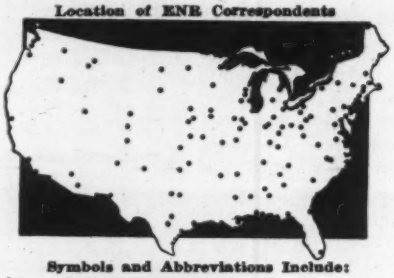
Classes of Construction
(Named in order of Listing)

Water Supply	Unclassified
Sewers, Waste Disposal	Materials, Equipment
Bridges, Grade Cross'gs	Public Buildings
Streets & Roads	Commercial Buildings
Earthwork, Waterways	Industrial Buildings

Stages Reported

PROPOSED: (except Streets & Roads);
BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);
LOW BIDDERS ($500,000 projects and over);
CONTRACTS AWARDED

Location of ENR Correspondents



Symbols and Abbreviations Include:

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD McGraw-Hill Construction Daily

WATER SUPPLY

PROPOSED WORK

Ark., Magnolia — Exten. watermains and other imprvs. **$25,000.**

Ark., Morrilton—New WW sys. M. Z. Bair, Gazette Bldg., Little Rock, engr.

Calif, Coronado—California Water & Telephone Co., 19 W. 9 St., National City, 1 m.g. water tank within city limits. $75,000-$80,000.

Calif, San Francisco—P. Utilities Comn., City Hall, 8 in. water mains and 30,000 gal. reservoir Hunters Point Dist., for City and San Francisco Co. Over $25,000.

Ia., Woodward—State, Des Moines, bids soon, water and sewage treatment plant at state hospital, **$100,000.** H. R. Green Co., 417 First Ave. S. E., Cedar Rapids, engrs.

Mich., Adrian—Water Bd., W. S. Barrett, acting mgr., Municipal WW, 500,000 gal. elevated water storage tank.

O., Georgetown—B. H. Crawford, mayor, general imprvs. to city WW sys. **$35,000.**

S. C., Charleston—Comrs. P. Wks., 14 George St., bids within 50 days, exten. WW to include 5 suburban subdivisions, St. Andrews Parish. **$86,000.** J. E. Gibson, 14 George St., engr. CD 2/3—ENR 2/9.

Tex., Baird—Large lake to supplement present water supply. Over $15,000.

Wash., Coulee City—Voted bonds replacing mains with larger c.i. pipe. $35,000. CD 1/20—ENR 2/2.

Wash., Spokane—A. Lindsay, water supt., City Hall, watermain replacements. $108,865. Included in 1940 budget.

★ **Wash., Spokane**—A. Lindsay, water supt., City Hall, reservoir, pump station and warehouse, $784,000; exten. pump. station, $39,500. Funds budgeted for 1940.

Wash., Sunnyside—K. Stone, city clk., increasing reservoir storage from 250,000 to 1 mg. capacity, constructing second feed line from reservoir to city distr. sys., water main addns., fire hydrants, well. $90,000.

Wyo., Greybull—$235,000 bond election Sept. 12, water pipe line from Canton to City.

B. C., New Westminster—Plans Connaught Heights water supply. $40,000 available. H. Stewardson, City Hall, engr.

Ont., Burlington—M. M. Bush, town clk., water intake pipe. $35,000. G. H. Power, Oakville, engr.

Ont., Sudbury—J. T. Dunne, clk. McKim Twp., bids soon, 1,530 lin. ft. watermain installation for Gatchell Substation, $40,000; meters, $1,500. Gore & Storrie, 1130 Bay St., Toronto, engrs. CD 1/18.

Que., Montreal—Executive Com., City Hall, concrete covering MacTavish and Outremont Water Reservoirs. $150,000. J. E. Blanchard, City Hall, dir. P. Wks.

Que., Ste Agathe des Monts—J. Magor, engr., Town Hall, additional development Prefontaine Dam on Nash River for water supply. $30,000.

BIDS ASKED

Bids Asked August 28

N. Y., Babylon—Long Island State Park Comn., Babylon, aeration plant, reservoir, piping, equip., etc. at Jones Beach State Park.

Bids Asked August 31

Va., Richmond—Bd. Supervs. Henrico Co., at office W. F. Day, mgr., 22 and Main Sts., water distr. sys. in Sanitary Dist. 5, Lakeside area. $150,000. Plans being considered water sys., Deep Run area, $170,000, and is expected to begin after completion Lakeside area project.

Bids Asked September 6

Calif., Eldridge — State Div. Architecture, Dpt. P. Wks., P. Wks. Bldg., Sacramento, repairing Fern Lake South Dam, installing standpipe, gates on existing tower, etc., at Sonoma State Home.

Bids Asked September 15

Ont., Lambeth—C. Kirk, clk. Westminster Twp., WW exten. and connection with London sys. $20,000. F. A. Bell, County Bldg., St. Thomas, engr. CD 7/20—ENR 7/27.

Bids Asked October 6

Calif., Los Angeles — Metropolitan Water Dist. of Southern California, 306 W. 3 St., water softening and filtration plant, etc., for distr. sys. of Colorado River Aqueduct near town of LaVerne, Los Angeles Co. F. E. Weymouth, genl. mgr. and ch. engr.; adv. ENR 8/24.

Bids Asked

Colo., Rifle—Reservoir and supply line. G. M. Heinsen, Glenwood Springs, engr. CD 4/21.

CONTRACTS AWARDED

Colo., Kremmling—Catch basin and pipe line, to Luke E. Smith, 1225 12 St., Denver; furnishing pipe, to Hardesty Mfg. Co., 3063 Blake St., Denver. Total est. **$17,278.** F. I. Huntington, Hot Sulphur Sprjngs, engr.

Ill., Pekin—Pekin Waterworks Co., W. E. Lautz, mgr., rein.-con. reservoir for WW plant, to G. E. Tillman, Centralia, **$63,500.** Bids 7/27. CD 7/12.

N. J., Bloomingdale—C.i. watermains in various streets, **WPA. $35,205.** CD 6/21—ENR 6/29.

N. Y., Lakewood—Extend. c.i. watermains, hydrants, service connections, meters, etc., outside village in surrounding communities Crystal Ave., etc., own forces under supervision of J. E. Hill, 24½ Main St., North East, Pa., engr. Over $15,000. CD 8/4—ENR 8/10.

★ **N. Y., New York**—Bd. Water Supply, 346 B'way, contr. 340, Lackawack dam of Rondout Reservoir, Lackawack Village, town of Wawarsing, Ulster Co., to Mason & Hanger Co., Inc., 500 5 Ave., **$15,486,150.** Bids 7/25, awarded 8/16. CD 7/26—ENR 8/3.

O., Wellsville—Equip. necessary for installation Booster Pump Station and pipe line to Spring Hill Cemetery, to R. E. Getz, Baltic, **$15,571.** Est. $15,000. Awarded 8/10.

R. I., Providence—J. F. Collins, mayor, City Hall, Providence, filter controls, miscellaneous equip. for filtration plant Scituate, incl. rate controllers, transmitters, etc., to Builders Iron Fdry, 9 Codding St., **$21,400. PWA.** Bids 8/14. CD 8/10.

Tex., Hamlin—4¼ mi. c.i. pipe and appurtenances between Wells and city limits, to Panhandle Constr. Co., Lubbock, approx. **$15,000.** Bids 8/8. CD 8/1.

Ont., Tillsonburg—J. Teckoe, municipality supt., water well pump on Gashen Rd., to International Water Supply Ltd., 12 Maitland St., London. Est. **$17,000.** Awarded 8/9. CD 7/19—ENR 7/27.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

Calif., San Bernardino—Big Bear Lake Sanitation Dist. c/o County Clerk, sewage treatment plant, 3 pump. sta, all necessary pipes, conduits, equip. $196,300. H. L. Way, Court House San Bernardino, engr. CD 5/24—ENR 6/1.

Conn., Southbury—R. A. Hurley, comr. P. Wks., State Office Bldg., Hartford, sewage disposal sys. for State Training School and Hospital. Over $25,000. F. J. Dixon, State Office Bldg., Hartford, archt.

★ **Ga., Atlanta** — Incinerator $500,000, WW $500,000. Robert & Co., Bona Allen Bldg., engrs. CD 8/10—ENR 8/17.

Ia., Cherokee—State, Des Moines, bids soon sewage treatment plant at Cherkee State Hospital. $60,000 **Maturity in fall.** W. E. Buell Co., 508 Insurance Exch. Bldg., Sioux City, engrs.

Ia., Eldora—State, Des Moines, bids soon, sewage treatment plant at Iowa State boys' reformatory $40,000. H. R. Green Co., 417 First Ave. S.E. Cedar Rapids, engrs. CD 1/23—ENR 1/26.

N. C., Bessemer (Greensboro P. O.)—Bessemer Sanitary Dist., I. D. Bialock, chn., bond election Sept. 23 sewer and water facilities. $45,000.

N. D., New Salem—C. M. Cunningham, mayor, sewerage and water sys. Over $25,000. P. M. Barnes, Valley City, engr.

O., Glouster — Defeated $51,000 bonds, sewerage sys. C. F. Wallace, mayor.

O., Lorain—Inclosing 36th St. ditch and installing concrete and steel storm sewers. Application made for WPA funds, $338,000. H. F. Alexander, city engr.

★ **O., Sandusky**—Storm water sewer project to replace present sys. $750,000. CD 5/29—ENR 6/1.

Wash., Oak Harbor—$10,022 bond election Sept. 26, to be used with WPA funds for sewers. $29,000. R. Maylor, mayor. CD 7/24—ENR 7/27.

Ont., Westminster Twp.—C. Kirk, Glanworth, Ont., twp. clk., bids end August, sewers. $52,000. A. Bell, Court House, St. Thomas, engr.

BIDS ASKED

Bids Asked September 1

Mich., Wahjamega—At Office G. C. Dillman, state budget dir., Lansing. Contr. 2, readvertisement sewage treatment plant and pump. sta., at Michigan State Hospital for Epileptics. PWA; adv. ENR 8/24. CD 8/1—ENR 8/3.

Bids Asked September 5

Calif., Oakland—Sanitary sewerage sys. portions Mountain Blvd., etc., vitr. pipe, concrete jacket in concrete cradle and vitr. clay pipe in Montclair Dist. $177,000.

Bids Asked September 6

Calif., Stockton—State Div. Architecture, P. Wks. Bldg., Sacramento, sewage disposal plant at State Hospital Farm.

Bids Asked September 15

Ont., Lambeth—C. Kirk, clk. Westminster Twp., sewerage sys. $25,000. F. A. Bell, Court House, St. Thomas, engr. CD 7/21—ENR 7/27.

Bids Asked

Calif., Chico—Storm sewer W. 7 St.

N. J., Seaside Park—E. D. McClary, 10 E. 40 St., New York, N. Y., taking bids completing sewage disposal plant. Former contractor defaulted on contract. Sherman & Sleeper, 501 Cooper St., Camden, engrs. CD 1/3—ENR 1/5, under CA.

N. Y., Hudson Falls—Standard Accident Insurance Co., 75 State St., Albany, for completion sewage disposal plant. Former contract to Donovo & Wende, 340 Leedale St., Albany, rescinded. PWA. Whitman, Requardt & Smith, 75 State St., Albany, engrs. CD 1/16—ENR 1/19, under CA.

LOW BIDDERS

★ **D. C., Wash.**—District Comrs., Dist. Bids Aug. 18, constructing Rock Creek Diversion Sewer, West Side Sect., from Stiers Bros. Constr. Co., 2944 Magazine St., St.

(Contract Unit Prices continued from page 13)

CONDITIONS: High mountain work with large percentage of hard rock and early winter conditions. Contractor to furnish all materials and complete work in 170 calendar days. Rail and highway transportation facilities available. Wage rates on project are: skilled, $1.10 per hr.; semi-skilled, 70c.; and common labor, 50c. per hr.

BIDS: Three bids were opened June 9, 1939, ranging from the contract low of $363,259 to $524,475. Engineer's estimate, $307,857. Items of gravel surfacing, wire cable guard fence, and timber guard posts were included in original unit prices, but were eliminated before contract was awarded. Contract was awarded to low bidder June 20.

LOW BIDDERS:

1. Ed. H. Honnen, Colorado Springs, Colo. (contract) $363,259
2. Pioneer Constr. & Engr. Co., Denver, Colo... 441,343
3. George W. Condon Co., Omaha, Nebr..... 524,475

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clear and grub	L. S.	$7,000.00	$20,000.00	$10,000.00
2. Unclass. excav.	465,000 c. y.	.62	.70	.90
3. Dry rock excav., struct.	1,400 c. y.	1.50	2.00	3.00
4. Dry com. excav., struct.	1,510 c. y.	1.00	1.25	2.00
5. Wet rock excav., struct.	380 c. y.	2.00	3.00	5.00
6. Wet com. excav., struct.	440 c. y.	1.50	.300	4.00
7. Overhaul	572,000 sta. y.	.01	.02	.02
8. Overhaul	6,500 y. mi.	.20	.20	.20
9. Class A concrete	746 c. y.	24.00	28.00	26.00
10. Reinforcing steel	70,200 lb.	.05	.06	.06
11. Cement rubble masonry	313 c. y.	12.00	26.00	30.00
12. Dry rubble masonry	41 c. y.	3.00	10.00	20.00
13. 24-in. corr. met. pipe. culv.	5,344 l. f.	2.70	3.25	3.40
14. 30-in. corr. met. pipe, culv.	108 l. f.	3.30	4.00	4.00
15. 36-in. corr. met. pipe, culv.	1,136 l. f.	5.00	5.50	7.00
16. 48-in. corr. met. pipe, culv.	98 l. f.	8.50	9.50	11.00
17. 135-in. multi-plate corr. met. pipe	140 l. f.	50.00	100.00	53.00
18. Heavy riprap	205 c. y.	2.50	3.00	4.00
19. Grout rubble slope pave. 12-in.	69 s. y.	3.50	6.00	4.00
20. 8-in. perf. corr. met. pipe, drain	418 l. f.	1.80	3.00	3.00
21. 24-in. perf. corr. met. pipe drain	96 l. f.	3.50	5.00	5.00
22. Project marker	1 ea.	25.00	25.00	25.00
23. Right-of-way marker	90 ea.	5.00	6.00	7.00

WATERWORKS, OREGON

OWNER: Columbia City, Oregon, J. L. Heglund, mayor; H. L. Gilbert, Portland, engineer.

PROJECT: Constructing waterworks, Columbia City, Columbia County, Oregon, including reinforced concrete reservoir, pump house, pump, cast iron pipe and fittings.

CONDITIONS: Rail, highway and water transportation available. Wages on project are: skilled, $1.50 per hr.; semi-skilled, $1.00 per hr.; and common, 62½c. per hr.

BIDS: Eight bids were received June 19, 1939, ranging from the contract low of $22,738 to $31,346. Contract approved by PWA and awarded August 11, 1939.

LOW BIDDERS:

1. Superior Constr. Co., Seattle, Wash. (contract) $22,738
2. F. J. Gregorie & Charles Prigge, Portland, Ore. 22,965
3. Eugene Ruedy, Portland, Ore..... 24,558

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Cast iron pipe, 6-in.	3,180 l. f.	$0.90	$0.89	$0.94
2. Cast iron pipe, 4-in.	6,750 l. f.	.61	.58	.65
3. Cast iron pipe, 3-in.	7,320 l. f.	.52	.49	.555
4. Gate valves, 6-in.	7 ea.	32.00	34.15	33.60
5. Gate valves, 4-in.	19 ea.	22.00	22.50	21.80
6. Gate valves, 3-in.	14 ea.	18.00	20.00	18.40
7. Cast iron fittings	7,376 lb.	.07	.09	.08
8. Fire hydrants	20 ea.	50.00	43.75	49.50
9. Concrete anchorages	10 c. y.	10.00	10.00	12.00
10. Com. excav. and backfill	2,950 c. y.	.65	.75	.65
11. Solid rock excav.	10 c. y.	6.00	1.00	2.00
12. Pavement	5 s. y.	3.00	1.50	.50
13. Service connections	100 ea.	16.00	17.25	15.00
14. Highway undercrossings	L. S.	75.00	105.00	76.00
15. Railroad undercrossings	L. S.	75.00	105.00	76.00
16. Pump unit, complete	L. S.	2,300.00	2,350.00	2,294.00
17. Reinf. conc. reservoir	L. S.	2,800.00	3,131.00	4,146.00
18. Galvanized pipe, ¾-in.	4,000 lb.	.15	.10	.24

SEWERS, MISSOURI

OWNER: University City, Mo., (St. Louis P. O.), Horner and Shifrin, St. Louis, consulting engineers; Walter Heimbuecher, city engineer.

PROJECT: Constructing joint district sewer ranging from 6 to 66-in. in diameter, Canton-Hanley Joint Sewer District. To be of vitrified clay, concrete, brick or segmental block construction, together with necessary junctions, inlets and manholes.

CONDITIONS: Materials to be furnished by contractor. To be completed in 200 consecutive calendar days. Transportation by highway available. Wage rates on project are: skilled, $1.50 to $1.75 per hr.; semi-skilled, $1.00 to $1.10 per hr.; and common, 80c. per hr.

BIDS: Nine bids were opened June 21, 1939, ranging from the contract low of $98,792 to $132,649. Engineer's estimate, $119,460.

LOW BIDDERS:

1. Samuel Kraus Co., St. Louis, Mo. (contract) $98,792
2. Martin & Reilly Constr. Co., University City, Mo..... 98,995
3. Henry L. Perkinson, St. Louis, Mo..... 103,015

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trap inlet, type B	12 ea	$75.00	$85.00	$75.00
2. Excavation, Cl. A	16,000 c y	1.70	.90	1.90
3. Excavation, Cl. B	700 c y	1.70	1.20	1.90
4. Excavation, Cl. C	4,200 c y	1.70	5.00	1.90
5. Lumber, left in trench	20 M ft	30.00	30.00	30.00
6. Granular fill	300 c y	2.00	.90	1.50
7. Restore macadam pavmt	3,100 s y	1.50	1.25	1.25
8. Extra macadam	50 ton	2.50	2.25	2.50
9. Extra screenings	25 ton	2.50	2.25	2.50
10. Sewer pipe, 6-in	50 l f	.55	.21	.35
11. Sewer pipe, 8-in	50 l f	.60	.31	.52
12. Sewer pipe, 10-in	20 l f	.70	.43	.60
13. Sewer pipe, 12-in	530 l f	.90	.55	.63
14. Sewer pipe, 15-in	355 l f	1.25	.90	1.05
15. Sewer pipe, 18-in	455 l f	1.40	1.68	1.35
16. Sewer pipe, 21-in	38 l f	1.80	1.40	1.90
17. Sewer pipe, 24-in	281 l f	2.30	1.84	2.60
18. Sewer pipe, 33-in	367 l f	3.30	3.50	4.50
19. Sewer pipe, 36-in	367 l. f.	3.70	3.74	5.20
20. Elbow, 10-in. dia	3 ea.	2.00	2.00	3.50
21. T-junction, 10-in. dia	3 ea.	2.50	2.00	3.50
22. Elbow, 12-in. dia	2 ea.	2.80	2.50	4.00
23. T-junction, 12-in. dia	2 ea.	3.00	2.50	4.00
24. 6-in. Y-junction on 15-in. pipe sewer	2 ea.	4.00	1.00	4.00
25. 6-in. Y-junction on 33-in. pipe sewer	2 ea.	1.00	1.00	7.00
26. 6-in. Y-junction on 36-in. pipe sewer	2 ea.	1.00	1.00	10.00
27. 45-in. conc. pipe sew., or 48-in. brick or seg. block	821 l. f.	7.00	8.02	6.00
28. 48-in. conc. pipe sew., or 51-in. brick or seg. block	855 l. f.	7.25	8.89	8.00
29. 51-in. conc. pipe sew., or 54-in. brick or seg. block	1,577 l. f.	9.00	9.12	9.00
30. 54-in. conc. pipe sew., or 57-in. brick or seg. block	1,007 l. f.	10.00	10.07	10.00
31. 63-in. conc. pipe sew., or 66-in. brick or seg. block	297 l. f.	12.00	12.27	12.00
32. 66-in. conc. pipe sew., or 69-in. brick or seg. block	317 l. f.	13.00	12.78	14.00
33. 6-in. Y-junct. on sew. 39-in	80 ea.	1.00	1.00	5.00
34. 8-in. Y-junct. on sew. 39-in	2 ea.	2.00	2.00	3.00
35. 10-in. Y-junct. on sew. 39-in	2 ea.	2.50	2.60	3.00
36. 12-in. Y-junct. on sew. 39-in	11 ea.	5.00	3.50	4.00
37. 15-in. Y-junct. on sew. 39-in	2 ea.	7.50	5.50	5.00
38. Com. brick masonry	120 c. y.	26.19	25.00	20.00
39. Cast iron	13,000 lb.	.045	.035	.03
40. Cl. B concrete	75 c. y.	12.00	10.00	14.00
41. Cl. C concrete	20 c. y.	11.00	8.00	12.00
42. Riprap	40 s. y.	3.50	1.80	1.50
43. Conn. exist. house drains	200 l. f.	1.00	.40	1.00
44. 6-in. pipe stub in manhole	4 ea.	1.00	.90	1.50
45. 8-in. pipe stub in manhole	1 ea.	1.00	1.10	1.50
46. 10-in. pipe stub in manhole	1 ea.	1.70	1.40	2.00
47. 12-in. pipe stub in manhole	17 ea.	2.50	1.80	3.00
48. 15-in. pipe stub in manhole	3 ea.	5.00	2.90	4.00
49. 33-in. pipe stub in manhole	1 ea.	15.00	16.00	25.00
50. Conc. curb and gutter	10 l. f.	2.50	5.60	1.50
51. Replace conc. sidewalk	100 s. f.	.30	.30	.25
52. Junct. chamb., Hanley Rd. and Canton Ave	L. S.	2,000.00	1,228.44	2,500.00

Sewers, etc. (Continued)
Louis, Mo., $801,620. PWA. Noted CD 8/1—ENR 8/3.

CONTRACTS AWARDED

†**Ill., Chanute Field**—Con. Q.M., Chanute Field, sewerage disposal sys., to Gene Tillman. Centralia, **$75,700.** Bids 8/8, awarded 8/8. CD 7/19—ENR 7/27.

Ind., Rensselaer — Sewerage sys. addn., **WPA. $25,000.**

Mich., Detroit — Wayne Co., furnishing motorized sewage disposal plant equip., to General Motors Corp., General Motors Bldg., **$10,598 PWA.** Bids 8/8. CD 7/26—ENR 8/3.

†**Neb., Fort Crook**—Con. Q.M., sewage disposal sys., storm sewers, roads, pistol range, smaller imprvs. for buildings. **WPA. $15,912.**

N. Y., Lockport—Contr. 11, sewage treatment plant, to Couse & Saunders, Lyndon Ave., Detroit, Mich. **$210,000.** Est. $206,000. **PWA.** Bids 8/4. CD 7/21—ENR 7/27.

N. J., Livingston—Boro, sewerage sys., to Antonio Lambo, 96 Wellington St., Hartford, Conn., **$36,889.** Former contractor refused award. CD 7/25—ENR 7/27, under CA.

R. I., West Warwick—Town, C. H. Carson, chn. Sewer com., Town Hall, sewage treatment plant, 32x39 ft. control house, 12x25 ft. Clyde Pump House, 15x35 ft., Natick Pump House, to James A. Munroe & Sons, 159 North Washington St., North Attleboro, Mass., **$183,337. PWA.** Bids 8/11. CD 8/8—ENR 8/3.

BRIDGES, GRADE CROSSINGS

PROPOSED WORK

Iowa—State Hy. Comn., Ames, 28x22 ft I-beam bridge, 6 concrete box culverts, Local County Rd. from S.H. 33, 2 mi. north of Ashton, thence west to Lyon Co. line, FAS 201 D, Osceola Co. F. R. White, ch. engr.

Iowa—State Hy. Comn., Ames, 195x42 ft. continuous I-beam bridge S.H. 163 at east corporate limits of Des Moines, FA 216, Polk Co.; 2 concrete box culvert exten., 1—50x22 ft. and 1—24x22 ft. I-beam bridges, FAS 202, Buena Vista Co.; 3 concrete box culverts and exten., County Trunk Rd., B from U. S. 71 to Co. Trunk Rd. D, FAS 199 A, Sac Co.

Mass., Northampton—City, W. A. Howes, supt. Streets Commonwealth of Massachusetts, Dpt. P. Wks., J. W. Beal, comr., 100 Nashua St., Boston, 80 ft. single span, steel beam bridge with concrete deck and approaches. West St. $60,000. G. H. Delano, ch. engr. Dpt. P. Wks.

Missouri—State Hy. Comn., Jefferson City, plans one 50 and two 40 ft. rein.-con deck girder span, bridge over Beaver Creek, Rolla-Houston Rd., Route 63, Project FA 110-A2, Phelps Co.; one 33 ft. and two 15 ft. I-beam span bridge over Sleek Creek, Route 4 Rd. south, Route SJ Project FAS 72A1, Nodaway Co.; one 12 ft. rein.-con. slab span culvert type bridge over Dry Branch, Butler-Henry Co. line Rd., Route SH Project FAS 884B1, Bates Co. C. W. Brown, Jefferson City, engr.

★**Mo., Randolph**—Chicago River & Indiana R.R. Co., LaSalle St. Sta., Chicago, Ill., O. Gersbach, ch. engr., single track railroad bridge over Missouri River, near here. $2,000,000. Engineer not appointed.

★**N. Y., Brooklyn**—Long Island R.R. Co., A. C. Watson, ch. engr., Penna Sta., New York, bids soon eliminating 24 grade crossings along Atlantic Ave. Est. $24,000,000. CD 5/27/38—ENR 6/2/39.

N. Y., Elmira—City and Delaware, Lackawanna & Western R.R., G. A. Phillips, ch. engr., Hoboken, N. J., bids in September concrete pedestrian underpass under railroad tracks, 5 St. $33,500. R. D. Klebes, city mgr. CD 11/15.

N. Y., North Hempstead—Long Island R.R. Co., Pennsylvania Sta., New York, A. C. Watson, ch. engr., grade crossing elimination, Clinton Rd. $121,000. **Maturity soon.** P. S. Comn., Albany, ordered immediate construction.

★**N. Y., Rockaway Beach**—Long Island R.R. Co., A. C. Watson, ch. engr., Penna Sta., New York, bids soon eliminating grade crossings. $9,000,000.

O., Lorain—Subway under Baltimore & Ohio R.R. at 32 St. and laying necessary storm sewer in connection. $170,000. H. F. Alexander, city engr.

★**O., Youngstown** — Bd. Comrs. Mahoning Co., new bridges at Spring Common, Bridge St.; at Lowelleville, over Yellow Creek on Western Reserve Rd., east of Woodworth; at Lake Park in Smith Twp., over Mahoning River; new Pricetown bridge; repairing Dewey Ave. bridge, new abutments, cleaning and painting, $3,340; Charley Run bridge, wing w11 reconstruction, $6,960; Market St. bridge, cleaning, painting steel reinforcement, $4,000; Center St. bridge, cleaning, painting and steel reinforcement, $11,300; McGuffey St. bridge, cleaning, painting and steel reinforcement, $6,200; South Ave. bridge, cleaning, painting, relaying floor, replacing hand rail, $2,850; Mahoning Ave. bridge, steel reinforcement, $8,600; Wilson Ave. bridge, new center support and flooring, $15,000. Total est. $500,000. R. J. Schomer, co. engr.

†**Oklahoma**—U. S. Eng., Denison, Tex., 650 ft. bridge for Frisco Ry. over Washita River at Rovia, Johnston Co., $60,000; 5,010 ft. bridge over Washita River at Madill, $70,000; 4,050 ft. bridge for Frisco Ry. over Washita River near Madill, $225,000, both Marshall Co.; 550 ft. highway bridge over Washita River at Tishomingo, Johnston Co., $88,000; 550 ft. bridge for Frisco Ry. across Rock Creek, Bryan Co., $50,000.

Oklahoma—State Hy. Dpt., Oklahoma City, 4,010 ft. I-beam bridge over Canadian River, near Norman, Cleveland Co., $500,000; 880 ft. I-beam bridge over Salt Fork River, Harmon Co., $90,000. V. T. Moon, Capitol, Oklahoma City, engr.

Okla., Red Oak—State Hy. Dpt., Oklahoma City, 320 ft. I-beam bridge, concrete piers, Latimer Co., $30,000. V. T. Moon, Capitol, Oklahoma City, engr.

Que., Montreal—City Clerk, bids soon subway under Canadian National Ry. tracks on Wellington St. between Richmond and Congregation Sts. $250,000. CD 5/24—ENR 6/1.

BIDS ASKED

Bids Asked August 29

Massachusetts—Commonwealth of Massachusetts, Dpt. P. Wks., J. W. Beal, comr., 100 Nashua St., Boston, concrete slab, concrete beam bridge, 2 steel stringer bridges, gravel, stone, tar road mix surfacing 47,950 sq. yd., approx. 1,830 sq. yd. bituminous macadam or penolithic surfacing, etc. hy. FAP 44-B and FAS 296-A, Windsor, Cummington and Worthington. Over $190,000. Bids 5/2 rejected. CD 8/16—ENR 4/27.

Bids Asked September 1

Minnesota—State Hy. Dpt., St. Paul, Bridge 5820, 130 ft. concrete deck girder over Trunk Hys. 52 and 55, 5 mi. south of West St. Paul, Dakota Co. Over $25,000. J. T. Ellison, ch. engr.

Texas—State Hy. Comn., J. Montgomery state hy. engr., Austin, fender exten. Intra-Coastal Canal Bridge on Hy. 87, Jefferson Co., $16,000; spot cleaning and painting 6 bridges, Goliad, Karnes and San Patricio Counties, $3,000; painting metal structure Brazos River Bridge, Brazos Co., $3,000; pedestrian sidewalk and widening approaches Cypress Creek Bridge, Marion Co., $10,000; widening concrete slab bridges, exten. single and multiple box culverts, widening roadway approaches on U. S. 90, Liberty Co., $160,000; widening 5 concrete slab bridges and roadway approaches on U. S. 90, Brewster Co., $20,000.

Bids Asked September 5

O., Cincinnati—J. E. Root, P. Wks. Dir., City Hall, concrete deck paving Sixth St. Viaduct. $74,436. CD 8/9—ENR 8/17, under CA.

Bids Asked September 6

Calif., Hopland—C. H. Purcell, engr. State Hy. Dpt., P. Wks. Bldg., Sacramento, constructing one 108 ft. and two 84 ft main steel girder span bridge, with seven 38 ft. and two 29 ft. steel stringer approach spans, grading, plant mix surfacing 0.3 mi. over Russian River, ½ mi. east of here, Mendocino Co.

Bids Asked September 7

California—C. H .Purcell, engr. State Hy. Dpt., 808 State Bldg., Los Angeles, rein.-con. box girder bridge over Santa Paula Creek Hy 79, Ventura Co. Over $25,000.

Bids Asked before January 1

★**N. Y., Dunkirk**—New York Central R.R. Co., J. W. Pfau, ch. engr., 466 Lexington Ave., New York, grade crossing elimination project. $1,500,000. J. W. Jaynes, grade crossing engr., c/o owner, in charge. Changes in tracks, wires, signal lines, etc., temporary detours in connection with above, own forces. CD 7/31—ENR 8/3, under "Unclassified."

CONTRACTS AWARDED

Florida—State Rd. Dpt., Tallahassee, 202 ft. overhead bridge, 0.32 mi. approaches over tracks Atlantic Coast Line R.R., Rd. 13, Duval Co., to R. T. Gordon, Atlantic Natl. Bank Bldg., Jacksonville, **$77,672.** Bids 6/13. CD 6/5.

Illinois—State Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield, steel, rein.-con., I-beam bridge over Salt Creek Drainage Ditch, Champaign Co., to General Paving Co., 30 E. John St., Champaign, **$37,312.** E. Lieberman, Centennial Bldg., Springfield, engr. Bids 7/21, awarded 8/11.

Ill., Peoria—Peoria Co., rein.-con. box culvert, Sect. 57 C MFT and 20 ft. steel W. F. beam bridge, Sect. 57 B MFT, to R. H. Vetter, Dunlap, **$1,993** and **$5,729** respectively ***lead titanium paint for Sect. 57 C, to Model Wall Paper & Paint Co., **$176*****, bituminous road mix surfacing Sect. 32-15D and Sect. 19-S15 D, to Swords McDougal Co., Peoria, **$8,407** and **$8,178** respectively*** Sect. 56 MFT, to C. L. Swords, Peoria, **$20,247** ***Sect. 56 A MFT, to Illinois Corrugated Culvert Co., Peoria, **$2,473.** Grand total $47,203. Bids 7/27. CD 7/18—ENR 7/20.

Maine—State Hy. Comn., L. D. Barrows, ch. engr., Augusta, Colby College underpass, Waterville, to Phoenix Bridge Co., Phoenixville, Pa., **$5,675*****overpass over tracks of Maine Central R.R., Detroit, to H. L. Goodrich, Pittsfield, **$19,934*****Dyke Brook Bridge, Columbia, to G. Ingalls, Bar Harbor, **$7,729** ***Gillespie Bridge, Bowdoin, to Lewiston Crushed Stone Co., Inc., South Ave., Lewiston, and E. C. Snodgrass, 82 Concord St., Portland, **$11,752.** Grand total $45,090. Bids 8/9, awarded 8/11. CD 8/2.

†**Mississippi**—Public Roads Administration, Vicksburg, steel beam bridge over Black Creek, to Coggin & Deermont, Chipley, Fla., **$41,357.** Subject to approval of Bureau Pub. Wks. Bids 8/10, awarded 8/12. CD 7/25—ENR 7/27.

New Jersey—E. D. Sterner, comr. Hy. Dpt. Trenton, river pier shafts of Raritan River Bridge, Middlesex Co., to P. F. Connolly Co., Raritan River Bridge, Woodbridge. **$358,599.** Bids 7/28. CD 7/10—ENR 7/15.

New Jersey—E. D. Sterner, comr. State Hy. Dpt. Trenton, bridge over Pennsylvania-Reading Seashore Lines, Route 51—Sect. 1, Gloucester Co., to Joseph Nesto & Son, 299 Highland Ave., Newark, **$103,926.** Bids 8/4. CD 7/18—ENR 7/20.

★**N. Y., Aqueduct**—Long Island R.R. Co., at office A. C. Watson, ch. engr., Pennsylvania Sta., New York, steel, concrete grade crossing, to Wilson & English, 50 Church St., New York, **$950,068.** Bids 8/8. CD 8/1—ENR 8/3.

Oklahoma—State Hy. Dpt., Oklahoma City, to Merveldt & Lawson Inc., El Reno, 660 ft. bridge at Garber, Garfield Co., $36,255, est. $48,455***to Ottinger Bros. Co., Hinton, 240 ft. bridge at Kelleyville, Creek Co., $22,602, est. $24,989; 240 ft. bridge at Stillwater, Payne Co., **$18,168,** est $21,148***to J. M. Fisher, Norman, 144 ft. bridge at Warner, Muskogee Co., **$10,993,** est. $12,640; 288 ft. bridge at Garber, Garfield Co., **$19,106,** est. $22,289*** to Nims & Frost, Hydro, 526 ft. bridge at Alluwee, Nowata Co., **$37,488,** est. $44,217; 255 ft. bridge at Krebs, Pittsburg Co., **$20,866, est.** $22,456; 420 ft. bridge at Krebs, Pittsburg Co., **$31,864,** est $35,000; 488 ft. bridge at Krebs, Pittsburg Co., **$34,628,** est. $37,649; 244 ft. bridge at Krebs, Pittsburg Co., **$19,557,** est. $21,657. Grand total $251,527. Bids 8/15. CD 7/7—ENR 7/13.

Pennsylvania—State Hy. Dpt., Harrisburg, I-beam bridge, bituminous surfacing, Monroe Co., to H. R. Miller Co., Lancaster, Pa., **$116,443.** Bids 8/4. CD 7/25—ENR 7/27.

Tennessee—State Dpt. Hys. & P. Wks., Nashville, constructing 0.32 mi. overhead and approaches, Rutherford Co., also 0.104 mi. underpass and approaches, Davidson Co., to Marion Constr. Co., Rosebank Ave., Nashville, **$65,403** and **$32,318** respectively***0.348 mi. underpass and approaches, Robertson Co., to J. B. Michael, P. O. Box 850, Memphis, **$67,223***0.011 mi. underpass and approaches, Roane Co., to G. M. Ferris, Athens, **$19,422** ***widening bridge, etc., Blount Co., to McDougald Constr. Co., Box 1655, Atlanta, **$12,813.** Grand total $197,178. Bids 8/11. CD 8/2.

Quebec — Provincial Government, Quebec City, rein.-con. bridge over Mars River, Bagotville, to Chicoutimi Constr. Co., Ltd., Chicoutimi, **$39,247.** CD 5/19—ENR 5/25.

Quebec — Provincial Government, Quebec City, one 47 ft. and two 40 ft. rein.-con. span bridges over Bournival River, at St. Barnabe, to Gaillardetz & Dupont, 52 Tamarac St., Shawinigan Falls, est. **$40,000;** three 30 ft. rein.-con. bridge over Ragged River, Irlande Sud, to Simeon Savoie, Plessiaville, est. **$18,000.** CD 8/8—ENR 8/10, under "St. Barnabe."

Que., Lake Megantic—Provincial Government, Quebec City, two 32 ft. and one 45 ft. rein.-con. span bridges over Felton River, to Roy & Dosti, Lake Megantic. Est. **$50,000.** O. Desjardines, Dpt. P. Wks., Quebec City, engr.

Que., Plaisance — Provincial Government, Quebec City, substructure 305 ft. bridge over Little Nation River, to J. T. Levasseur, 5001 5 Ave., Montreal, **$17,395;** superstructure, to MacKinnon Steel Corp., Sherbrooke, **$31,200.** CD 7/27—ENR 8/3.

Que., Port Alfred — Provincial Government, Quebec City, replacing concrete bridge with three 55 ft. span bridge over Mars River, to Chicoutimi Constr. Co., Ltd., Chicoutimi, **$39,247.** Dpt. P. Wks., Quebec City engrs.

STREETS AND ROADS

BIDS ASKED

Bids Asked August 28

Connecticut—At office W. J. Cox, hy. comr., State Office Bldg., Hartford, rein.-con. paving about 725 ft. Merritt Parkway, 1,115 ft. approaches White Plains Rd., Trumbull; 2,262 ft. Southbury-Seymour Rd., Route 67, Southbury; bituminous macadam or Colprovia paving 4,450 ft. Granby Rd., Route 20, East Granby; bituminous macadam surfacing 11,634 ft. Rimmon Rd., Woodbridge; waterbound macadam paving, miscellaneous work 250 ft. Depot Rd., Haddam; waterbound macadam paving 6,035 ft. road in 3 sections, Durham; rolled bank run gravel surfacing 6,650 ft. Bunker Rd., Canton; 2,726 ft. Peck Hollow Rd., Franklin; 8,453 ft. Wells Rd., Granby; 4,423 ft. Avery Rd., Ledyard; 15,800 ft. Cedarhurst and Currituck Rds., Newtown; 6,521 ft. 3 sections roads Sprague; 2,608 ft. Hickory St. and Turner Ave., Trumbull; grading,